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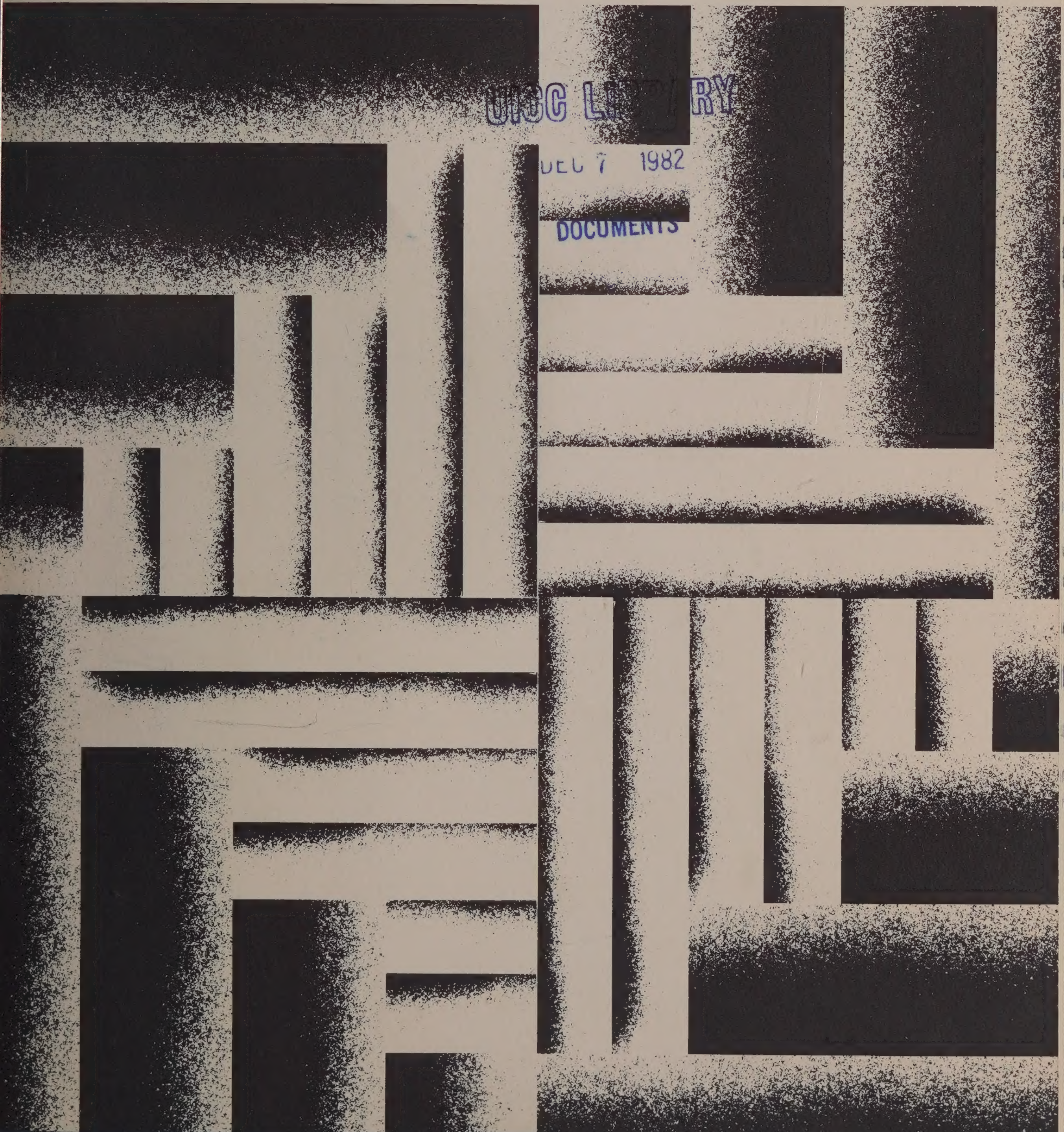
Economic and Social Survey of Asia and the Pacific 1980



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Economic and Social Survey of Asia and the Pacific 1980

UNITED NATIONS
Bangkok, 1981

Since the 1957 issue, the *Economic and Social Survey of Asia and the Pacific* has, in addition to a review of the current situation of the region, contained a study or studies of some major aspect(s) or problem(s) of economies of Asia and the Pacific, as specified below:

1957: Postwar problems of economic development
1958: Review of postwar industrialization
1959: Foreign trade of ECAFE primary exporting countries
1960: Public finance in the postwar period
1961: Economic growth of ECAFE countries
1962: Asia's trade with western Europe
1963: Import substitution and export diversification
1964: Economic development and the role of the agricultural sector
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1967: Policies and planning for export
1968: Economic problems of export-dependent countries. Implications of economic controls and liberalization
1969: Strategies for agricultural development. Intra-regional trade as a growth strategy
1970: The role of foreign private investment in economic development and co-operation in the ECAFE region. Problems and prospects of the ECAFE region in the Second Development Decade
1971: Economic growth and social justice. Economic growth and employment. Economic growth and income distribution
1972: First biennial review of social and economic developments in ECAFE developing countries during the Second United Nations Development Decade
1973: Education and employment
1974: Mid-term review and appraisal of the International Development Strategy for the Second United Nations Development Decade in the ESCAP region, 1974
1975: Rural development, the small farmer and institutional reform
1976: Biennial review and appraisal of the International Development Strategy at the regional level for the Second United Nations Development Decade in the ESCAP region, 1976
1977: The international economic crises and developing Asia and the Pacific
1978: Biennial review and appraisal at the regional level of the International Development Strategy for the Second United Nations Development Decade
1979: Regional development strategy for the 1980s
1980: Short-term economic policy aspects of the energy situation in the ESCAP region

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PREFACE

The present *Survey* is the thirty-fourth in a series of reports prepared annually by the Economic and Social Commission for Asia and the Pacific (ESCAP). A major object of these *Surveys* is the analysis of recent economic and social developments in the region and of related international developments. Particular attention is paid to economic and social policy issues and broad development strategies.

In recent years, in addition to the review and analysis of economic and social developments, it has been the practice to present in the *Survey* reports of studies concerning major issues in the countries of the region, as a contribution to the continuing effort to understand the behaviour of their economies and to assess the implications of their experiences for economic and social policy.

Part one of the present *Survey* contains a review of recent economic developments in the region. Part two presents the secretariat study entitled "Short-term economic policy aspects of the energy situation in the ESCAP region" which was the main theme for discussion at the thirty-seventh session of ESCAP. The study reviews the energy situation in developing ESCAP countries and analyses the impact on these economies of the 1973/74 increase in oil prices. The major economic policy options available for the short-term management of energy demand and supply are discussed in detail and the importance of energy planning is stressed. Because of the unique circumstances of the South Pacific countries, separate attention is given to their problems and a number of possibilities for regional, interregional and international co-operation are considered.

This *Survey* is published on the sole responsibility of the ESCAP secretariat. Although the contents have benefited from the comments of independent experts and of official representatives of member countries, the views expressed herein are not necessarily those of the Commission or the Governments of its members and associate members.

Bangkok, April 1981

EXPLANATORY NOTE

The term "ESCAP region" is used in the present issue of the *Survey* to include Afghanistan, Australia, Bangladesh, Bhutan, Brunei, Burma, China, the Cook Islands, Democratic Kampuchea, Fiji, Hong Kong, India, Indonesia, Iran, Japan, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Nauru, Nepal, New Zealand, Niue, Pakistan, Papua New Guinea, the Philippines, Republic of Kiribati, the Republic of Korea, Samoa, Singapore, the Solomon Islands, Sri Lanka, Thailand, Tonga, the Trust Territory of the Pacific Islands, Tuvalu, Vanuatu and Viet Nam. The term "developing ESCAP region" excludes Australia, Japan and New Zealand.

The designations employed in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country or territory or of its authorities, or concerning the delimitation of its frontiers.

Reference to "tons" indicates metric tons.

The term "billion" signifies a thousand million.

In the tables, three dots (...) indicate that data are not available or are not separately reported, a dash (—) indicates that the amount is nil or negligible, and a blank indicates that the item is not applicable.

In dates, a hyphen (-) is used to signify the full period involved, including the beginning and end years, and a stroke (/) indicates a crop year, a fiscal year or plan year. The plan years of the ESCAP countries coincide with their fiscal years as given in the table below:

Country	*Fiscal year*	*Currency and abbreviation*	*Mid-point rate of exchange for $US 1 as of December 1980*
Afghanistan	21 March to 20 March	Afghani (Af)	44.50
Australia	1 July to 30 June	Australian dollar ($A)	0.847
Bangladesh	1 July to 30 June	Taka (Tk)	16.25
Bhutan	1 April to 31 March	Ngultrum (Nu)	7.93
Brunei	1 January to 31 December	Brunei dollar ($Br)	2.09
Burma	1 October to 30 September	Kyat (K)	6.757
China	1 January to 31 December	Yuan Renminbi (¥RMB)	1.508[a]
Cook Islands	1 April to 31 March	New Zealand dollar ($NZ)	1.039
Democratic Kampuchea	1 January to 31 December	Riel (R)	...
Fiji	1 January to 31 December	Fijian dollar ($F)	0.7911
Hong Kong	1 January to 31 December	Hong Kong dollar ($HK)	5.140
India	1 April to 31 March	Rupee (Rs)	7.930
Indonesia	1 April to 31 March	Rupiah (Rp)	626.7
Iran	21 March to 20 March	Rial (Rls)	72.32
Japan	1 April to 31 March	Yen (¥)	203.00
Kiribati	1 July to 30 June	Australian dollar ($A)	0.847
Lao People's Democratic Republic	1 July to 30 June	Kip	...
Malaysia	1 January to 31 December	Ringgit ($M)	2.222
Maldives	1 October to 30 September	Rupee (Rs)	7.550[b]
Mongolia	1 January to 31 December	Tughrik (T)	2.85[c]
Nauru	1 July to 30 June	Australian dollar ($A)	0.847
Nepal	16 July to 15 July	Rupee (Rs)	12.000
New Zealand	1 April to 31 March	New Zealand dollar ($NZ)	1.039
Pakistan	1 July to 30 June	Rupee (Rs)	9.900
Papua New Guinea	1 July to 30 June	Kina (K)	0.644
Philippines	1 January to 31 December	Peso (₱)	7.594
Republic of Korea	1 January to 31 December	Won (W)	659.9
Samoa	1 January to 31 December	Tala ($WS)	0.929
Singapore	1 January to 31 December	Singapore dollar ($S)	2.0935
Solomon Islands	1 January to 31 December	Solomon Islands dollar ($SI)	0.847
Sri Lanka	1 January to 31 December	Rupee (Rs)	18.00
Thailand	1 October to 30 September	Baht (Bht)	20.630
Tonga	1 July to 30 June	Tongan dollar ($T)	0.935
Viet Nam	...	Dong	2.17[d]

Source: United Nations, *Monthly Bulletin of Statistics,* March 1981; Asian Development Bank, *Key Indicators,* April 1981 and national sources.

Notes: [a] Cross rate based on Hong Kong dollar rates.

[b] October 1980.

[c] Basic rate denotes a fixed rate.

[d] December 1979.

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Part one

RECENT ECONOMIC DEVELOPMENTS, 1979-1980

I. INTERNATIONAL ECONOMIC DEVELOPMENTS

A. DEVELOPMENTS IN THE WORLD ECONOMY, 1979-1980[1]

1. Introduction

1. From 1979 to mid-1980 world economic performance was affected by three adverse developments: rates of inflation were generally high and accelerating; growth in real output slowed markedly in the industrial economies and virtually stagnated in 1980; and large surplus and deficit positions reappeared in the balance-of-payments positions of different groups of countries, again raising doubts about the ability of many non-oil developing countries[2] to finance adequately their emerging deficit positions.

2. At the same time, by comparison with the period that followed the sharp 1973 increase in oil prices, there were hopeful signs. The increase in inflation in the industrial economies was not so marked; business confidence as reflected in the level of fixed investment activity was less affected; the emerging distribution of current account imbalances in the industrial economies provoked less intense competition for funds urgently required by the non-oil-exporting developing countries, and, finally, exchange rate adjustments, while substantial, were not accompanied by the adjustment problems experienced in the 1974-1975 period.

2. Output and prices

3. Recent policy developments in the industrial economies emphasize the desire to combat inflation as their major policy objective, despite sluggish rates of increase and even stagnation in real output. The general level of prices in these countries since 1970-1972 has been rising at more than double the rate of the preceding decade, when it averaged 4 per cent. Recently, the rate has further accelerated as a result of both sharp increases in the price of oil and the use of expansionary demand policies in 1979. Growth in the level of output in the industrial economies which preceded the current recession was moderate. From 1976 it did not exceed 4.0 per cent and in 1980 the level of economic activity appeared to have virtually stagnated with actual declines likely in the case of the United Kingdom and the United States economies.

4. Table 1 sets out information concerning the developing countries with respect to output and inflation during the period 1967-1979. It can be seen that real rates of growth of output in 1979 were modest for these countries, considered as a group, by comparison with previous years but in view of the heterogeneity of the countries concerned such aggregate performance is not particularly meaningful, although the outputs of all these countries have been affected by the intensification of stagflation in the industrial countries.

5. While the financial resources of the oil-exporting countries were greatly augmented by the recent oil price increases, the expansion of aggregate demand within these countries has been moderated to avoid the reappearance of excessive domestic demand and so as not to exacerbate the rate of growth in the expatriate labour force. Moreover, the over-all expansion of output for this group of countries has been materially reduced by the fall in economic activity in Iran.

6. While table 1 indicates that the over-all performance of the non-oil developing countries was not markedly below the average level of performance in the 1970s, several qualifications are necessary. First, as discussed below, the aggregate figure disguises marked departures from the norm which affect the majority of the world's poverty population. Secondly, even in aggregate, the rate of growth in output was low by comparison with the 1960s and, given the high over-all growth rate in population, the impact of this decline in real output upon *per capita* income is extremely serious. Two major external factors affecting the over-all performance of this group of countries were the escalation in the cost of oil imports and the combined impact of decreased economic activity and the continued high level of protectionism in the industrial countries.

7. Within the non-oil developing economies there are several small countries which export oil in limited amounts. Their average real rate of growth in GDP in 1979 was 7 per cent, compared with 4 per cent for the large majority of developing countries which are net oil importers. Furthermore, within this latter group of countries the growth performance of 11 middle-income manufacturing exporters was about 50 per cent better than that of the oil-importing countries considered as a group.

---

[1] This section draws heavily upon the analysis presented in International Monetary Fund, *Annual Report, 1980* (Washington D.C., 1980), especially chap. 1.

[2] Defined to include all oil-importing developing countries and 12 small net oil exporters (with the exception of China) from which exports of oil were either less than two thirds of total exports or less than 100 million barrels a year on average for 1976–1978.

Table 1. Developing countries. Changes in output and prices, 1967-1979

(Percentage changes)

	Average 1962-1972[a]	*Change from preceding year*						
		1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Real GDP								
Oil-exporting countries	9.0	10.7	8.0	—0.3	12.1	6.2	2.7	2.9
Oil sector	...	13.2	—1.0	—11.1	13.3	2.1	—4.2	3.0
Non-oil sectors	...	9.7	12.3	12.4	11.1	9.3	7.3	2.8
Non-oil developing countries and areas[b]	5.9	6.7	5.5	4.4	5.5	5.1	5.0	4.7
By area								
Africa	5.0	3.8	6.9	2.9	4.9	1.7	2.7	2.6
Asia	4.9	6.2	3.9	6.5	6.2	6.8	6.9	3.5
Europe	6.8	5.8	4.0	4.4	7.5	5.7	4.0	3.5
Middle East	6.4	4.8	—	8.8	1.8	6.8	6.3	7.9
Western hemisphere	6.8	8.4	7.3	3.0	4.7	4.4	4.7	6.3
By analytical group								
Net oil exporters	5.9	7.4	6.2	5.1	4.8	3.6	5.8	7.2
Net oil importers	5.9	6.5	5.3	4.3	5.6	5.3	4.9	4.2
Major exporters of manufactures[c]	7.7	9.6	6.9	3.5	6.4	5.1	5.4	6.3
Low-income countries[d]	4.0	3.5	2.9	6.1	3.2	5.3	4.3	—0.1
Other net oil importers	5.5	4.5	4.9	4.2	6.3	5.8	4.6	3.9
Consumer prices								
Oil-exporting countries	8.0	11.3	17.0	18.8	16.6	15.4	9.7	11.0
Non-oil developing countries[b]	9.3	20.3	27.2	27.9	24.0	27.0	23.4	29.1
Africa	4.5	9.7	15.4	15.1	13.2	16.9	14.8	20.3
Asia	5.5	15.1	27.3	10.6	0.1	7.8	5.9	10.3
Europe	7.9	13.1	18.4	14.9	12.4	16.1	22.3	28.7
Middle East	3.9	12.7	22.1	23.4	20.7	18.7	21.0	26.6
Western hemisphere	13.3	32.2	35.3	52.0	55.1	51.1	41.7	48.7

Source: International Monetary Fund, *Annual Report, 1980* (Washington D.C., 1980), p. 12.

Notes: [a] Compound annual rates of change.

[b] Except China.

[c] Includes Argentina, Brazil, Greece, Hong Kong, Israel, Portugal, Republic of Korea, Singapore, South Africa and Yugoslavia.

[d] Thirty-nine countries for which the *per capita* GDP, as estimated by the World Bank, did not exceed the equivalent of $US 300 in 1977.

8. It is the performance of the low-income, oil-importing developing countries, in which the bulk of the world's poverty population resides, which gives the major cause for concern, although even here average performance masks important differences. Over-all, in 1979, economic growth in this group of countries stagnated. Excluding India, however, which accounts for 45 per cent of the GDP of this group of countries and the output of which was exceptionally affected by adverse weather conditions in 1979, growth in output of the remaining 38 low-income countries averaged around 2 per cent, which meant a stagnation in *per capita* incomes. Low rates of investment to GDP are primarily the result of low domestic savings rates (which in turn reflect basic consumption requirements) and the lamentable failure of the developed world to provide the necessary augmentation in resources and economic opportunities required for this group of countries to achieve self-sustaining growth performances.

9. As might be expected, inflation is excessively high in the non-oil developing economies. In part, this is a result of inflation in the industrial countries and of escalating oil prices. In part also, in the majority of cases, it is a result of expansionary monetary and fiscal policies even where general supply shortages can be seen to exist.

3. Trade and payments

10. Tables 2 and 3 indicate that international trade in 1979 was characterized by a modest increase in volume and by marked changes in prices and terms of trade such that the combination of price and

volume changes resulted in an increase in the value of trade higher than in any year since 1974. Prices were markedly affected by the increased price of exports from the industrial economies, of exports of primary commodities and of oil in the world economy. While the increase in primary commodity prices exceeded that of manufactured goods, the increase in the price of oil on balance brought about a 2.5 per cent deterioration in the terms of trade of the non-oil-exporting developing countries. That the volume of world trade remained reasonably high in 1979 had much to do with the relatively high propensities to import of the European industrial economies, the growth in output of which was high by comparison with that of the United States, whereas growth in the volume of world trade for 1980 was materially and adversely affected by the stagnation in real output in the industrial countries. Present indications are that the volume of trade in 1980 will show no increase.

11. Major alterations in current account balances in the world economy are given in table 4 and are a result of movements in the terms of trade as well as of changes in domestic demand. Two main aspects have been a shift from a solid surplus position on current account in 1978, on the part of the industrial countries, to a worsening deficit position in 1979 and 1980, and an exacerbation of the deficit situation of the non-oil developing countries, whose current account balance shifted from $US 36 billion in 1978 to a projected $US 70 billion in 1980.

12. The impact on the industrial economies of this shift to an over-all deficit position is not likely to be serious. They are better able to absorb the implied reduction in real incomes owing to adverse terms-of-trade effects and they will be the initial recipients of much of the current surpluses of the oil-exporting countries.

Table 2. World trade summary, 1962-1979[a]

(Percentage changes in volume and in unit value of foreign trade)

		Average 1962-1972[b]	*Change from preceding year*						
			1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
World trade[c]									
Volume		9.0	13.0	5.5	−5.0	12.0	5.0	5.5	6.5
Unit value ($US terms)		2.5	23.5	40.5	9.0	2.0	9.0	10.0	18.5
(SDR terms)[d]		2.0	12.5	39.5	8.0	7.0	8.0	2.5	15.0
Volume of trade									
Imports	Industrial countries	9.5	12.5	2.0	−8.5	14.0	4.0	5.5	8.5
	Developing countries								
	Oil-exporting countries	9.0	21.5	37.5	42.0	19.0	14.0	6.5	−11.5
	Non-oil developing countries	6.0	12.5	8.0	−4.0	3.5	5.0	8.0	8.0
Exports	Industrial countries	9.0	13.5	7.5	−4.5	11.0	5.0	6.0	6.5
	Developing countries								
	Oil-exporting countries	9.0	12.5	−1.0	−11.0	14.5	—	−3.5	2.0
	Non-oil developing countries	7.0	8.5	3.0	0.5	14.0	6.5	10.5	8.5
Unit value of trade in SDR terms[d]									
Imports	Industrial countries	2.0	11.5	38.5	8.0	6.5	8.0	2.5	15.0
	Developing countries								
	Oil-exporting countries	2.0	11.0	27.5	9.5	6.5	7.5	5.0	11.0
	Non-oil developing countries	2.0	14.0	45.5	7.5	7.0	8.0	1.0	15.5
Exports	Industrial countries	2.0	10.0	22.5	10.5	5.5	7.0	5.5	12.0
	Developing countries								
	Oil-exporting countries	3.0	27.5	202.5	3.5	11.5	8.5	−6.5	42.5
	Non-oil developing countries	1.5	22.0	33.5	−3.0	10.5	11.0	−3.0	12.5

Source: IMF, *Annual Report, 1980*, p. 16.

Notes: [a] Figures are rounded to the nearest 0.5 percentage point.

[b] Compound annual rates of change.

[c] Sum of the groupings shown separately, based on approximate averages of growth rates for world exports and world imports.

[d] For years prior to 1970, an imputed value of $US 1.00 has been assigned to the SDR.

Table 3. Terms-of-trade developments, 1962-1979[a]

(Percentage changes)

	Average 1962-1972[b]	*Change from preceding year*						
		1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Industrial countries	—	−1.0	−11.0	2.5	−1.0	−1.0	3.0	−2.5
Developing countries								
Oil-exporting countries	1.0	15.0	137.0	−5.0	4.5	1.0	−10.5	28.0
Non-oil developing countries	−1.0	7.5	−8.0	−9.5	3.5	3.0	−4.0	−2.5
Reference: world trade prices (in $US terms) for major commodity groups[c]								
(a) Manufactures	3.0	17.5	22.1	12.5	—	9.0	14.5	14.5
(b) Oil	4.0	40.5	226.0	5.5	6.0	9.5	—	49.0
(c) Non-oil primary commodities (market prices)	2.5	55.0	28.0	−18.0	12.0	20.0	−5.0	16.0

Source: IMF, *Annual Report, 1980*, p. 17.

Notes: [a] Based on foreign trade unit value.

[b] Compound annual rates of change.

[c] As represented, respectively, by: (a) the United Nations export unit value index for the manufactures of the developed countries; (b) the oil export unit values of the oil-exporting countries; and (c) the International Financial Statistics index of market quotations for non-oil primary commodities.

Table 4. Payments balances on current account, 1973-1980[a]

($US millions)

	1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*
Industrial countries	19.3	−11.6	17.9	−0.5	−4.1	33.4	−9.8	−50
Seven larger countries	14.1	−3.8	23.0	9.0	9.3	36.1	2.9	−29
Other countries	5.2	−7.8	−5.1	−9.6	−13.4	−2.7	−12.7	−21
Developing countries								
Oil-exporting countries	6.6	67.8	35.0	40.0	31.9	5.0	68.4	115
Non-oil developing countries	−11.5	−36.9	−45.9	−32.9	−28.6	−35.8	−52.9	−70
By area								
Africa	−2.1	−4.8	−9.1	−8.2	−6.2	−7.0	−4.9	...
Asia	−2.6	−9.9	−8.8	−3.4	−1.5	−5.6	−13.5	...
Europe	0.3	−4.4	−4.8	−4.2	−7.5	−5.1	−9.3	...
Middle East	−2.3	−4.4	−6.6	−5.3	−4.9	−5.7	−7.9	...
Western hemisphere	−4.8	−13.3	−16.5	−11.8	−8.5	−12.4	−17.4	...
Total[b]	14.4	19.3	7.0	6.6	−0.8	2.6	5.7	−5

Source: Same as table 3.

Notes: [a] On goods, services and private transfers.

[b] Reflects errors, omissions and asymmetries in reported balance-of-payments statistics, plus balance of listed groups with other countries.

13. The situation of the non-oil developing countries as shown in table 5 is much more serious although, once again, there are significant differences among the subgroups of these countries. Among these countries the 12 small oil-exporting countries have run sizable but easily manageable deficits to sustain a high level of imports and economic activity; their current account deficits rose substantially in 1979 and apparently again in 1980. Another subgroup, which is comprised of the major exporters of manufactures, has also run generally high current account deficits in order to sustain imports and high real output growth. The deficits have been met by recourse to foreign exchange reserves or by borrowing in commercial capital markets. Although their deficits have accounted for a large proportion of the over-all current account deficit position of the non-oil developing countries, they have proven to be generally manageable; even in 1979 they were only 3.5 per cent of combined GDP or 15 per cent of

Table 5. Non-oil developing countries. Current account deficits as percentage of GDP and of merchandise imports, 1973-1979

	1973	1974	1975	1976	1977	1978	1979
	As percentage of GDP						
Non-oil developing countries	2.0	5.2	6.0	3.9	3.0	3.2	4.0
Net oil exporters	2.9	4.4	7.1	4.9	4.4	4.2	3.3
Net oil importers	1.9	5.4	5.7	3.7	2.8	3.1	4.0
Major exporters of manufactures	1.5	6.2	6.0	3.4	2.0	1.9	3.5
Low-income countries	3.1	5.0	4.5	2.5	1.6	3.0	3.7
Other net oil importers	1.2	4.0	6.5	5.4	5.5	5.7	5.8
	As percentage of merchandise imports						
Non-oil developing countries	12.4	25.3	30.2	20.6	15.6	16.8	19.1
Net oil exporters	22.5	25.6	42.8	29.8	25.1	24.0	17.3
Net oil importers	10.8	25.2	27.9	19.1	13.9	15.5	19.3
Major exporters of manufactures	7.5	26.4	27.0	16.7	9.3	9.1	15.3
Low-income countries	35.4	44.2	41.5	24.8	15.8	27.3	32.8
Other net oil importers	5.5	14.3	23.7	20.9	21.2	22.1	21.8

Source: Same as table 3, p. 30.

imports, which compares favourably with the over-all position of non-oil developing countries, where similar figures were 6.5 and 32 per cent respectively.

14. In sharp contrast to the above two subgroups of developing countries is the position of the low-income countries. With the exception of India, the 39 countries in this group have tended to experience persistently high external deficit situations and a virtual stagnation of growth in real imports since 1973. The latter is attributable to the decline in their real exports (in terms of import purchasing power), especially in 1978 and again in 1979, to inadequate flows of concessionary and non-concessionary finance and to weakened external reserve positions.

15. Finally, there is a large group of mainly middle-income countries mainly dependent upon primary commodity exports for their foreign exchange receipts. Their current account deficit position has worsened substantially since 1973 through to 1979 and into 1980. They have financed their deficit position from both private and official sources, with private short-term capital flows becoming more important in 1979 and 1980.

16. Important changes occurred in over-all net foreign borrowings by non-oil developing countries in 1979 and 1980. The net flow of long-term capital declined slightly in 1979 and 1980, indicating increasing caution on the part of private financial institutions. At the same time, there was a sharp rise in short-term credits and a relatively moderate rise in the flows of official long-term capital.

17. There has also been a steady increase in the ratio of public and publicly guaranteed long-term debt to exports of goods and services and to GDP for the same groups of countries. These ratios were 80 and 18.5 per cent respectively in 1979, as compared with 70 and 14 per cent respectively in 1973, with ratios for the low-income group of countries being considerably higher. For example, the debt/export ratio of the low-income subgroup was approximately 200 per cent in 1979. It is the position of this lower income group which gives cause for concern as far as debt servicing is concerned, particularly when the shortening of loan maturities and high interest rates charged are also taken in account.[3]

B. THE INTERNATIONAL SITUATION: PROSPECTS

1. Introduction

18. Given that the economic performance of the industrial economies heavily influences aggregate global economic activity and thereby materially affects the prospects of developing countries, a tentative examination of the prospects for growth of the former is made below.[4]

19. The industrial market economies which make up the Organisation for Economic Co-operation and Development (OECD) have moved into a recession and it is likely that, in aggregate, they have experienced a decline in their gross national product in

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[3] These ratios would be much higher if non-publicly guaranteed private debt was also included.

[4] This analysis is based upon forecasts contained in OECD, *Economic Outlook*, No. 28 (December 1980).

the second half of 1980. Given existing policies in these countries and in the absence of any large increase in oil prices, it appears that a slow recovery will commence in the first half of 1981 and that an over-all rate of growth in GNP of 3.0 per cent could be attained by the first half of 1982. As a result, the level of unemployment seems certain to increase substantially to as much as 7.5 per cent of the developed industrial countries' labour force in the first half of 1982. The impact of the recession, together with generally restrictive monetary and fiscal policies, should result in a slowing down of inflation, although inflation is likely to remain by early 1982 in excess of rates prevailing in 1978 before the sharp oil price increases of that year. The impact of the recession should also generally reduce the size of current account deficits in the major developed industrial economies and the United States of America should move into a large surplus position.

20. Given these trends in the OECD countries, the developing oil-importing countries are likely to continue to be in a serious balance-of-payments deficit position as a result of both slow growth in export markets and the continuing burden of oil imports. Some of these countries could experience serious financing problems in view of their likely international debt positions.

2. Output, employment and prices

21. Table 6 sets out the anticipated rates of growth in real income for the industrial economies from 1979 to early 1982. In aggregate, there has been virtually no growth in these economies during 1980 with a modest recovery forecast during 1981, when the over-all growth rate will be around 2.5 per cent and reach an annual rate of growth of 3.0 per cent in the first quarter of 1982. The stagnation in economic activity in 1980 can be primarily attributed to the sharp increase in oil prices from late 1978 to mid-1980, which during the same period reduced over-all growth in the industrial countries by some five percentage points, and to the tight monetary and fiscal policies adopted to combat inflation. It is also attributable to the less perceptible but pervasive impact on productivity of the protectionist policies generally used by these countries. The modest recovery in growth envisaged is based on an anticipated increase in investment in response to the increased share of profits in GNPs and to likely buoyant exports to OPEC. Monetary and fiscal policies, however, are likely to remain tight.

22. Reduction of unacceptably high rates of inflation will remain the major objective of policy in the industrial countries, with tight monetary and fiscal measures being the main policy weapons. As a consequence, a small reduction in inflation can be anticipated although over-all it is unlikely to fall to the pre-oil-price-increase levels of 1978. Inflation as measured by the GDP deflator for the seven largest countries in OECD was running at 7.9 per cent per annum in the last half of 1978, rose to 10.5 per cent per annum in the second half of 1980 and could fall to 8.25 per cent per annum in the first half of 1982.

23. Within this over-all aggregate demand situation, unemployment has continued at unacceptably high levels. Unemployment increased in both absolute and percentage terms during 1980 to 6.5 per cent of the labour force and on the basis of likely increases in output and productivity will rise further to 7.5 per cent in the first half of 1982. This will tend to exacerbate pressures for protection in industries in which unemployment of youth and an increase in the duration of unemployment have occurred.

Table 6. OECD economies. Growth of real GNP/GDP

(Percentage changes seasonally adjusted at annual rates)

	1980 I	*1981 I*	*1982 I*	*From previous half-year*			
	1979 I	*1980 I*	*1981 I*	*1980 II*	*1981 I*	*1981 II*	*1982 I*
United States	0	—0.25	3	—1.75	1	2.5	3.5
Japan	5.9	3.25	4.5	2.75	4	4.25	4.75
Federal Republic of Germany	3.6	—1.25	1.75	—3	0.5	1.5	2
Other major countries	1.9	—1	1.5	—2.25	0.5	1	2
Smaller OECD countries	1.7	1.25	2	1	1.5	2	2
Total OECD	2.0	0.25	2.5	—0.75	1.5	2.25	3

Source: OECD, *Economic Outlook*, No. 28 (December 1980), p. 7.

3. External prospects

24. Table 7 indicates that while further rises in the price of oil imports and other commodities worsened the OECD current deficit in early 1980, sluggish growth in the economies of its members and rising exports to OPEC are expected to combine to reduce the over-all deficit from $US 96 billion to $US 34 billion in the first half of 1982.

25. During the same period, assuming unchanged real oil prices, the OPEC surplus is expected to decline as a result of a further reduction in the volume of oil exports and of the rapid expansion of visible and invisible imports. The non-oil developing economies, considered as a whole, are expected to experience growing current account deficits, even if they are successful in reducing growth of their imports below that scheduled in their medium-term growth plans. Their exports to OECD countries, following a likely fall during 1980, are expected to grow slowly until early 1982, with relatively weak expansionary effects coming from exports to OPEC countries or among themselves. They are also expected to experience a doubling of their deficit with respect to services and net private transfers.

Table 7. OECD countries. Output, trade volumes and prices, and current balances

(Seasonally adjusted data at annual rates)

	1979	*1980*	*1981*	*1979*	*1980*		*1981*		*1982*
				II	*I*	*II*	*I*	*II*	*I*
A. Output and merchandise trade (percentage changes)									
Total exports	6.25	5	2.5	8	7.5	−2.25	3.75	5	5.75
Total imports	8.25	−0.75	−0.25	5.25	—	−7.5	2	3.5	4.75
Exports to non-OECD	3	9.5	8	11	10.75	5.25	9.25	8.75	6
Imports from non-OECD	5	−5.5	—	9.5	−10.5	−9	−3	4	2.5
Memorandum items									
Exports to:									
OPEC	−16	20	15.75	33.5	23.5	4.5	20	18.5	10
Other developing countries	9.25	4	3.75	1.5	4.75	4.25	3.5	3.75	2.5
Other non-OECD countries	9.5	10.25	8	13	10	8	8	8	8
Imports from:									
OPEC	—	−15	−3.5	8.75	−24	−17.5	2	1.75	1.75
Other developing countries	10.25	2	1.75	11.5	—	−3.5	3	4.75	3
Other non-OECD countries	9	4	3.5	8	1.5	−1	5	4	5
B. Domestic deflators and trade prices (average values) (percentage changes)									
GNP deflator	8.25	9.5	10	8.5	9.25	11	9.75	9	8.75
Trade prices in dollars									
Total exports	15	14	7.25	18.5	14	10.5	5.5	8.5	8
of which, manufactures	14.5	12	7	15.5	12	9	5.5	8.25	7.5
Total imports	18.75	22.25	6.75	33.25	25.25	8	5.25	8.5	8
Imports of oil	48.5	52	11.5	105.25	57.75	19	9.5	8.25	8
Imports of non-oil commodities	10.75	13.5	5.5	11	18	1.75	6.5	7.5	8
of which, food	5.25	10.5	6.25	7	16	3.5	7.75	6	6
raw materials	12.5	16.25	4.75	25.5	21	—	5.25	8.75	10
Memorandum item									
OECD terms of trade with rest of world	−9	−18	—	−28	−23	7	—	—	—
C. World current balances ($US billions)									
OECD	−35	−74	−40	−64	−96	−51	−44	−37	−34
OPEC	68	116	82	99	122	111	87	78	68
Other developing countries	−37	−50	−56	−37	−45	−56	−55	−57	−60
Other non-OECD countries	−3	−5	−8	−3	−4	−6	−7	−10	−13
Total	−7	−12	−22	−5	−23	−2	−19	−25	−38

Source: OECD, *Economic Outlook*, No. 28, table 29, p. 55.

Note: The pattern of world trade in 1980 II – 1981 I is to some extent distorted by the effects of the war between Iraq and Iran.

II. OVER-ALL ECONOMIC PERFORMANCE OF THE DEVELOPING ESCAP ECONOMIES[5]

INTRODUCTION

26. Acceleration in the rate of increase in price levels during 1979 and 1980 has been both widespread and pervasive. In many developing countries, rapid price increases have had mixed effects. The prospect of increasing sales, both domestically and overseas, has encouraged production and in increasing numbers of instances has begun to press upon capacity limits. Labour and material input costs have been rising, although the former have typically lagged behind the rise in prices of material inputs and of consumer goods. Consequently, production costs have risen and in 1979/80 often with increased intensity. Coupled with the rising costs of credit, these increases have clearly exerted a squeeze on profits. Especially during 1980, increased production costs have worked to reduce output in an ever-widening array of farms, firms and industries. Although the inducement generated by rising product prices to expand output has typically prevailed throughout the past two years, increased costs have in many developing countries in the region begun to impinge seriously upon output. The spread effects of this process have become apparent in most countries and in several instances distinct declines in commodity production have taken place. The minor boom in activity which has occurred in conjunction with rapidly increasing price levels has peaked. In a few cases, the upswing had clearly begun to subside during 1980 and the prospects for a more general slackening of activity are beginning to appear inescapable. As always, it is a matter of time and timing. Much will depend upon activity in the developed market economies but there is little doubt that the negligible growth which is occurring will characterize the coming year.

27. The pervasiveness of the most recent inflationary surge, beginning in 1979 and engulfing practically all market economies by 1980, makes it desirable to sketch the broad outline of this development as an introduction to a review of the macro performance of the developing economies of the Asian and Pacific region. Not only does virtually ubiquitous inflation influence economic activity levels, it also masks the movements of the real economy. Especially when price movements are both rapid and at varied rates, the necessity to distinguish between real and nominal changes is heightened. For the same reasons the technical possibility of making adequate distinctions is appreciably lessened. The limitations of mechanical techniques for describing rapid changes are such that they often impede comprehension of the significance of changes which are in progress.

28. Because the most comprehensive index of general price changes, the GDP price deflator,[6] is seldom available for the most recent period, recourse will have to be had to consumer price indexes (CPI), despite their limitations. The pattern of changes in consumer prices during the past three years is summarized in table 8. These patterns will be subjected to closer scrutiny at a later stage; the purpose here is to describe the broad patterns of price developments.

29. The synchronic pattern afforded by the data presented in the table reflects unmistakably the resurgence of rapid inflation during 1979 and 1980. Apart from the Pacific island economies, virtually all the others have been subject to rapid and accelerated rises in consumer prices. As the basic data are annual averages of monthly index numbers, the year-to-year changes are damped by averaging, relative to comparisons of monthly figures at annual intervals. Against the conventional double-digit bench-mark, it is immediately apparent that the upsurge occurred most generally among the east and south-east Asian economies in 1979. This is more explicitly shown by comparison of median values and the other indicators summarized in the lower panel of the table.

30. While any explanation of these patterns would require thorough analysis and much more information than can be presented here, there are several implicit questions worthy of note. The obvious association, for example, between the degree of dependence of an economy on external trade and its vulnerability to imported inflation helps to explain the contrasts between the south Asian economies and those of east and south-east Asia. Within the groups, however, specific cases, such as those of Malaysia and Singapore, reflect the obvious fact that external dependence is but one element in the equa-

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[5] Individual treatment has not been given to the developed ESCAP countries. For a review of recent economic and social developments in these countries, reference may be made to OECD and national sources.

[6] The GDP or GNP deflator is the price index implicit in the comparison of GDP or GNP data expressed in current prices and in constant prices for a stipulated period, typically a year.

Table 8. Developing ESCAP. Inflation patterns in consumer prices, 1978-1980

Annual percentage change	South Asia			East and south-east Asia				Pacific	
						12 months to			
	1978	1979	12 months to June 1980	1978	1979	June 1980	September 1980	1978	1979
							25.4 Republic of Korea		
25									
						23.8 Republic of Korea			
						21.5 Indonesia			
20									
			19.0 Sri Lanka				19.5 Thailand		
					18.9 Indonesia	18.3 Philippines	18.3 Indonesia		
					18.3 Republic of Korea	17.4 Thailand			
					16.5 Philippines		.... 16.8		
			15.5 Bangladesh				15.3 Hong Kong		
15									
				14.4 Republic of Korea		14.9 Hong Kong			
	13.2 Bangladesh								
	12.1 Sri Lanka	12.1 Bangladesh	12.8 Nepal						
			.... 11.6		11.2 Hong Kong			11.4 Solomon Islands	11.1 Samoa
		10.8 Sri Lanka	10.4 Pakistan		10.3 Thailand				
10									
		9.4 Pakistan	9.8 India	8.7 Thailand			9.6 Singapore	9.6 Tonga	8.0 Solomon Islands
				8.3 Indonesia					
		.... 7.9		7.3 Philippines		7.7 Singapore			7.7 Fiji
	6.7 Pakistan	6.4 India						6.1 Fiji	
	.... 6.1	6.2 Nepal							
		5.7 Burma		5.9 Hong Kong				5.8 Papua New Guinea	5.7 Papua New Guinea
	5.6 Nepal				5.5 Malaysia		5.5 Malaysia		5.5 Tonga
5			5.0 Burma						
				4.9 Malaysia		4.9 Malaysia			
				4.1 Singapore					
					4.0 Singapore				
	2.5 India							2.1 Samoa	
0									
	—6.1 Burma								

Table 8 *(continued)*

	South Asia			*East and south-east Asia*				*Pacific*	
						12 months to			
	1978	*1979*	*12 months to June 1980*	*1978*	*1979*	*June 1980*	*September 1980*	*1978*	*1979*
Annual percentage changes									
High	13	12	19	14	19	24	25	11	11
Median	6	8	12	7	11	17	17	6	8
Low	—6	6	5	4	4	5	6	2	5
Range[a]	19	6	14	10	15	19	20	9	6
Number of cases									
10+[b]	2	2	4	1	5	5	4	1	1
Total	6	6	6	7	7	7	6[c]	5	5

Source: United Nations, *Monthly Bulletin of Statistics*, December 1980, table 61 and national sources.

Notes: Upper panel: Broken lines with numbers (.... 16.8 ....) and those underscoring country or area names (7.3 Philippines) indicate median values.

[a] Percentage points.

[b] Double-digit inflation.

[c] Data for the Philippines are lacking.

tion. The complexity of the economy, related broadly to the structure of production, the degree of commercialization and articulation of markets and the development of monetary institutions, undoubtedly requires investigation if the contrasting price behaviour of the Pacific island economies is to be explained. Again, although the use of other indexes of price variation would be required, analysis of relationships between rates of inflation and rates of growth in real product would be instructive. Finally, however, the purpose in presenting these figures as part of the environment of development during 1979-1980 bears repetition. The implications of rapid and persistent inflation for a wide spectrum of conditions important to economic and social development — real incomes and their distribution, patterns of consumption and saving, living standards, changing patterns of property ownership and the structure of employment and production — are also important for the assessment of the attributes of growth in real product. Little of this can appropriately be discussed in the review which follows. It therefore seems fitting to express a general caveat at the outset.

A. GROWTH IN GROSS PRODUCT

31. On the pragmatic assumption that the margin of error in gross product estimates does not vary erratically from year to year, comparison of annual growth rates offers the most convenient summary of patterns of economic performance. Given the great variation in size, economic structure and institutional patterns among the countries of the region, direct comparisons among them are likely to be misleading. Perusal of the growth patterns among subgroups nevertheless serves to describe both the broad similarities and the discernible contrasts in performance. For this introductory purpose, table 9 presents percentage changes in real GDP or GNP growth for the past three years and provisional estimates for 1980.

32. It is apparent that the contrast between the more rapidly growing economies of east and south-east Asia and the rest, to which reference has frequently been made in this publication in recent years, has become far less marked during the past two years. With few exceptions, the years 1979 and 1980 reflect a fairly general pattern of winding down of growth in gross product. The apparent exceptions presented by the 1980 estimates for Burma and India cannot as yet be substantiated. Although the term stagflation was invented to describe the circumstances of the developed market economies and the structural conditions which have produced it differ importantly from those of the developing market economies, there may be some justification for using the term to describe a fair number of the latter as well.

Table 9. Selected developing ESCAP economies. Growth in real gross product, 1977-1980

	Annual percentage change in constant-price GDP			
	1977	*1978*	*1979*	*1980p*
South Asia				
Bangladesh[a]	1.7	8.1	4.0	6.1
Burma[b]	6.0	6.0	6.3	6.9[c]
India[b]	7.7	4.9	−2.9p	6.0[d]
Nepal[e]	3.0	1.5	3.7	−1.4
Pakistan[a]	2.5	7.0	5.9	6.2
Sri Lanka[f]	4.3	8.2	6.2	5.6
South-east Asia				
Indonesia	8.8	6.8	4.9	7.8
Malaysia	7.7	7.5	8.5	7.6
Philippines	5.6	5.8	5.8	4.7
Singapore	7.9	8.6	9.3	10.2r
Thailand	7.3	11.7	6.1r	6.3
East Asia				
Hong Kong	9.8	10.0	10.5	9.0r
Republic of Korea	10.0	11.3	7.4	−4.5[f]
Pacific				
Fiji[g]	4.4	2.5	10.0	4.0[h]
Papua New Guinea	−4.4[a]	−3.7	−1.9	0.9
Tonga[a]	4.7	0.3	4.2	...

Sources: National sources.
Notes: [a] FY ending June.
[b] FY beginning April.
[c] Plan target.
[d] Unofficial estimate.
[e] FY ending 15 July.
[f] GNP.
[g] GDP at factor cost.
[h] Forecast.
p Provisional.
r Revised.

33. Whether the incipient slowdown in the performance of many, perhaps the majority, of the developing market economies in the region is a persistent tendency remains unclear. Much will depend on the influence of performance in the developed economies during 1980 and 1981. During th second half of the 1970s, the effects of the recessio at mid-decade had in most cases been overcome. Growth rates in real product in the great majority of developing economies in the region have generally exceeded rates of population growth by a not inconsiderable margin. Even the relatively superficial information concerning rates of growth in real product suggests that broad changes are under way which may be important for the continued economic and social evolution of countries in the ESCAP region. It is useful to take a rather more thoroug look at some of the developments which lie behi the crude growth rates displayed in table 9.

34. Facing a world market plagued by resurgent inflation, with accompanying production cost increases and an incipient slowdown in merchandise exports during 1980, retardation in the growth of commodity production would seem a likely consequence in developing ESCAP economies. Demand for exports to overseas markets seems to have slackened during 1980, although the lack of comprehensive figures beyond the half-year mark makes a well-founded assessment difficult. Clearly, the GDP growth rates indicate a highly mixed and varied pattern. Contraction of real product has apparently occurred in Nepal (year ending 15 July 1980) and the Republic of Korea, while marked increases have taken place in India (as anticipated for the year ending in March 1981) and, less strikingly, in Indonesia. Virtually all the others for which at least a rough estimate can be made show a slight deceleration, in nearly all instances of less than a single percentage point. Because the circumstances of India and the Republic of Korea are so widely different — both in the long-term and from a short-term perspective — it would likely be misplaced emphasis to underscore the apparent reversal of positions on the growth scoreboard.

1. South-east and east Asia

35. Given the very considerable increase in petroleum prices during the past two years — in terms of annual averages, some 45 per cent in 1979 and about 70 per cent in 1980 — it is scarcely surprising that the expansion of real gross product in Indonesia has been an instance of export-led growth. In economies as different as the Philippines, where growth slackened, and Hong Kong, where a rapid rate of growth was well maintained, exports appear to have led the expansion. For others appreciably dependent upon exports, the role of the export sector during 1980 was rather more modest. A brief and in part impressionistic review of the patterns of demand and production sector contributions to the year's growth will help to distinguish some of the main elements in a fairly undistinguished growth panorama.

36. Growth in the Indonesian economy had been sluggish following, and in part owing to, the large devaluation of November 1978. By late 1980 most indicators pointed to an appreciable recovery of momentum derived in large part from rising oil prices. This increase and the rise in prices of several other commodity exports helped to counter the decline in oil production and the diminished export quantum of several other primary commodities. Revised estimates indicate that non-oil (and non-gas) exports will have fallen slightly from the 1979/80 record level. Although the trade balance is expected to have declined only moderately, the current account surplus will have been cut by more than half. Investment, from both domestic and foreign sources, seems to have accelerated during 1980 after a marked slackening in 1979. Capacity expansion in industry and oil refining as well as booming construction activity reflect in part the increase in foreign investment project approvals during 1979. Although the rate of implementation of such projects slackened sharply in that year, following an even sharper rise in 1978, implementation tends to lag behind approvals by at least a year. Oil exploration has been stepped up in response to the increase in crude prices and the decision to increase crude production. For calendar 1980 Pertamina expects a rate of 1,570,000 bpd, down from 1,590,000 during 1979, but at year's end the daily rate slightly exceeded 1,600,000 bpd; the estimate for 1980/81 (ending March) approaches 1,590,000 bpd. Paced by tin mining, other mining output has expanded satisfactorily or better, largely in response to rising prices.

37. At least a part of industry has recovered during the past year as adjustment has been made to the effects of devaluation; output from branches dependent upon imported inputs appears to have suffered most. Production of building materials has increased rapidly as has that of fertilizers and processed foods; even some import-dependent operations such as automobile and motorcycle assembly seem to have recovered by mid-1980 after sharp output declines in 1979. Thanks to favourable weather — ample and timely rains — and the absence of pests, together with wider and greater use of fertilizer, this year's rice crop has reached a record of 19.6 million tons (paddy). Other food-stuff production has increased moderately. Led by palm oil production, non-food agriculture has shown only moderate gains; hence performance for the whole sector has been good, markedly better than the preceding season. As agricultural output provides at least a third of gross product and more than half of total commodity production, the solid expansion of agricultural output contributes heavily to GDP growth. From roughly a 15 per cent share of the incremental growth in 1979, agriculture must have provided nearly a fourth in 1980.

38. In a year of generally quite satisfactory aggregate growth, the chief dissonant chord was the continuing inflation — at over 18 per cent in consumer prices (Jakarta) for the average of the 12 months ending September 1980, marginally slower than the rate recorded for the calendar year 1979.

39. Malaysia's merchandise exports amount to some three fifths of GNP, a far greater proportion

than in the other developing economies of the region apart from the urban economies, Hong Kong and Singapore. Consequently, the expansion of overseas demand for the products of Malaysian agriculture, mining and industry provides the predominant segment of aggregate demand even when export growth slackens, as it did in 1980, from more than 40 per cent in 1979 to about 15 per cent, both in terms of current prices. In real terms, virtually no growth in merchandise exports occurred during 1980. Gross domestic product continued to expand in that year, however, though at a lower rate than in 1979, at 7.6 per cent as against 8.5 per cent; the corresponding rates for GNP were 8 per cent, down from 8.9 per cent in 1971, all in price-adjusted values.

40. More rapid expansion occurred in components of domestic demand during 1980, providing a fillip to the aggregate expansion. With a characteristic lag of a year or more following a period of accelerated expansion of exports, fixed capital accumulation grew rapidly during 1980, several percentage points faster than during 1979. Expansion of production capacity in manufacturing, in both plant and equipment, investment in residential construction and commercial buildings and substantial investment in production capacity in the petroleum industry all contributed importantly. Capital expenditure in the public sector accelerated sharply during 1980, the final year of the Third Malaysia Plan. Stimulated by large wage and salary increases in both the public and the private sectors, private consumption expenditure grew at a moderately accelerated rate, while public consumption grew relatively more rapidly. Mercifully for the consumer, inflation in August was running at 5.5 per cent on a 12-month average comparison, or about the same as for the preceding calendar year. By mid-October an official estimate put the rate of increase of consumer prices at about 7 per cent for calendar 1980, still one of the lowest in the region.

41. On the production side, real value added by the manufacturing sector continued to grow in excess of 12 per cent, representing a minor degree of acceleration. The contribution to the increment in GDP was approximately a third of the total; in 1980 manufacturing value added accounted for over one fifth of GDP. Construction activity responded to increased demand with an acceleration slightly more rapid than that in manufacturing. Real value added from the mining sector declined by about 3 per cent during the year, reflecting a policy decision to slow the rate of petroleum exploitation and the impact of rising production costs, pre-eminently of diesel fuel, on profits in tin mining. In large part the response to flagging export demand, agricultural production expanded only marginally during the year, following a 4 per cent expansion (in constant prices) during 1979. The resultant expansion in total commodity production, of which agriculture provides rather less than half (the remainder coming from the industrial sector), slowed moderately in 1980 in comparison with the preceding year. The broad services sector grew at an accelerated pace, with wholesale and retail trades responding to the increased pace of activity in the industrial sector while government services also grew at an increasing rate.

42. Official estimates of aggregate real growth in the Philippines indicate a distinct deceleration in the expansion of GNP from 5.9 per cent in 1979 to 4.7 per cent in 1980. This figure lies below the 5.5 per cent target for the year and continues the deceleration from 6.3 per cent GNP growth in 1978. The average for the three years to 1980 (5.6 per cent) in turn lies below the average rate for the preceding five-year period of 6.3 per cent. Whether these changes constitute a trend remains unclear. The main factors cited as contributing to the 1980 deceleration are indeed exogenous and beyond the control of Philippine planners and policy makers — the oil price rise, recession in the industrialized countries, deterioration of the terms of external trade and the destruction of crops by typhoon. To these difficulties accelerating inflation should be added. Inflation had reasserted itself at double-digit rates during 1979. In the 12 months to June 1980, consumer prices in Metro Manila had risen at a rate of 22 per cent and wholesale prices were advancing at about the same pace; during the third quarter, however, both indexes appear to have begun to rise more moderately.

43. Despite the general slackening of overseas demand and the deterioration in the Philippine terms of trade during 1980, merchandise and service exports have been the dynamic element in Philippine economic growth over the year. Export prices generally increased (despite the drastic decline in coconut products prices, the largest of traditional exports), favouring exports of sugar, copper and timber. In common with most other economies in the region, though not with exporters of crude, the rise in petroleum prices in late 1979 and 1980 created an onerous drag on the economy and constituted the main element in the deterioration in the terms of trade. Manufactures exports — textiles, garments, electronics — did well in 1980. Services exports have grown markedly in the last two years, paced by construction labour in the Middle East, where some 100,000 Filipino workers were reported employed.

44. Earlier expectations of an acceleration in fixed investment have apparently not materialized, despite

reports of a record level of foreign investment inflows. Nevertheless, as a component of aggregate demand, fixed capital formation expanded more rapidly than consumption expenditures. Construction activities provided an increased share of this expansion, much of it occurring as part of the government programme to strengthen infrastructure in the less developed regions of the country. Among the major production sectors, industry has continued to expand at a rate somewhat lower than that of the preceding year and not very much more rapid than that of agriculture. With growth rates in the two commodity production sectors diverging only modestly and all three broad sectors — agriculture, industry and services — expanding at a respectable but clearly less than buoyant pace, the missing element in the equation is a thoroughly dynamic production sector.

45. A devastating drought, the worst in a quarter century, lasting from mid-1979 well into 1980, caused a serious decline in Thailand's agricultural output in the 1979/80 crop year. Drastically reduced water levels in major upcountry dams meant power shortages during the first half of 1980, reducing factory output, while raw material shortfalls depressed agro-processing activities; domestic demand for manufactures and other commodities slowed markedly as the incomes of the farming population declined. Rising fuel prices drove up production costs in manufacturing and transport and cut deeply into the output of sea fisheries. Escalating fuel prices and the costs of other imports coupled with domestic shortages and credit expansion contributed to accelerated price increases. Both consumer and wholesale prices rose to double-digit levels during 1979 and advanced by an additional 19 or 20 per cent during the 12 months to September 1980.

46. Reflecting the slowdown in commodity production during 1980, preliminary estimates of inflation-adjusted GDP show only a marginal increase over the expansion recorded during the preceding year (provisionally, 6.3 per cent as against 6.1 per cent in 1979). Estimates of GDP growth in 1979 and 1978 have in turn been revised downwards, yielding a less marked deceleration from 1978 to 1979 and only a slight recovery of momentum in 1980. All major components of expenditure on gross product continued to expand during 1980, but at lower rates, after allowance has been made for the effects of more rapidly rising prices. Imports of goods and services grew scarcely at all in real terms in 1980, while gross domestic expenditure grew slightly more rapidly than in 1979. Leading the expansion were exports of goods and services, though still at a rate lower than a year earlier. Merchandise exports grew in volume even though for several major commodity exports (including rice, rubber, sugar and tapioca products) appreciable price increases meant greater earnings from smaller tonnages than the year before. Public consumption expenditure expanded more slowly in 1980, while the pace of growth in real private consumption advanced only slightly. When detailed price data have been fully processed and applied to deflate nominal expenditures, it may well appear that private consumption grew very little in real terms during the year. Moderate expansion occurred in expenditure on fixed capital formation, showing a marked deceleration compared with 1979.

47. The counterpart of this pattern of growth in real aggregate demand appears in an expansion of value added commonly at rates slightly below those of 1979; these in turn reflect a deceleration from the rates of 1978. Agriculture, stricken by drought in 1979 and recording an appreciable decline in real value added, barely recovered in 1980. Mining and manufacturing led the industrial sector in an annual expansion rather less rapid than a year earlier, owing to rising production costs, power and material shortages and in some instances a slackening in demand. Demand for some building materials, such as rerolled steel products, fell off during the second half of the year as construction activity weakened. Commodity production as a whole grew slightly faster during 1980 and the full recovery of agriculture during the 1980/81 crop year promises a marked improvement in the total output of commodities in the coming year.

48. Aggregate growth of the predominantly manufactured goods exporters of south-east and east Asia was eminently satisfactory for Hong Kong and Singapore but, for a mixture of economic and political reasons, quite unsatisfactory for the Republic of Korea. The two urban economies, despite their differences in economic structure and patterns of merchandise trade, have been sufficiently agile to surmount the uncertainties borne of shifting demands for export goods and the vagaries of exchange rate fluctuations and wide swings in international money rates. Preliminary estimates of GDP growth in these economies indicate some slackening of pace for Hong Kong, from 10.5 per cent in 1979 to 9 per cent in 1980, and some acceleration for Singapore from 9.3 to 10.2 per cent — both presumably within the margin of error of the estimates.

49. Despite continuing uncertainty in international economic developments, the Singapore economy has sustained high rates of growth since recovery from the recession of 1974/75 and performed better in 1979 than in 1978. GDP growth reached 9.3 per cent in 1979, the highest since the oil crisis of 1973,

and accelerated in the first half of 1980 to a 10.7 per cent annual rate. Weaker external demand during the second half-year has reduced the rate slightly for the full year to 10.2 per cent.

50. External demand remains crucial to Singapore's economic performance. Domestically, high rates of saving and investment, human resource development, industrial restructuring and a flexible and adaptable system for the short- and medium-term management of the economy are equally necessary for continued progress.

51. In 1979 the manufacturing sector superseded the trade sector as the largest in the economy. During 1979, manufacturing, transport and communications were buoyant and in the first half of 1980 were joined by financial and business services, all recording two-digit growth rates. Manufacturing re-emerged as the fastest growing sector in 1979, with a growth rate of more than 14 per cent; all major industries performed well except textiles, garments and wood products while external demand favoured semi-conductors, oil rigs and ship-repair services. During 1980, manufacturing growth slowed somewhat while the trade sector maintained relatively stable growth of about 7 per cent. The construction sector staged a turnaround in 1979 with a growth rate of 7.5 per cent, rising to 10 per cent in 1980 and reflecting the revival of private sector construction in hotels, office and shopping complexes and industrial buildings; this expansion more than offset the decline in public housing construction.

52. Total consumption expenditures rose moderately in real terms in 1979, relative to 1978, mainly because of a sharp decline in the growth of public sector consumption, in turn the result of reduced defence outlays and restraint on recurrent expenditures. Private sector consumption maintained a steady increase of nearly 8 per cent, in line with the growth of per capita incomes. Gross domestic fixed capital formation in the Singapore economy grew more slowly during 1979 than in 1978. While private sector investment accelerated, that of the public sector declined. The investment climate remained favourable despite uncertain external conditions and the higher wage policy of 1979. Investment in manufacturing from foreign and local sources reached a new peak in 1980, with net investment commitments rising to $S 1,400 million ($US 664 million).

53. Continuing the growth pattern of 1979, GDP growth in the Hong Kong economy during the first half of 1980 was strongly export-led. Beginning during the third quarter, however, the expansion of domestic exports had begun to slacken. Domestic demand remained buoyant but the growth of real product failed to top 10 per cent for the year; nevertheless, preliminary estimates yield a quite satisfactory 9 per cent.

54. Despite a narrower trade gap in 1979, inflation rose at a record rate in 1979 and continued to accelerate during 1980; consumer prices were increasing at more than 15 per cent during the 12 months ending September. The sharp rise in world oil prices in 1979-1980 and the weakness of the Hong Kong dollar have been cited as major causal factors.

55. Total exports are expected to have grown by 17 per cent in real terms during 1980. Domestic exports, which account for about three fourths of the total, grew at about 18 per cent during the first half but slowed to around 15 per cent for the three quarters ending in September. Exports of textiles and garments grew least among major export categories and orders in hand in September foretold a continued slackness, largely attributable to stagnation in major overseas markets, the United States, the United Kingdom and the Federal Republic of Germany. Continued rapid growth in the *entrepôt* trade has helped to sustain total export growth; in this, the predominant trading partner is China.

56. Indicators of private consumption expenditure for 1980 suggest that this major segment of domestic demand has grown rapidly. Imports of consumer goods have expanded at rates exceeding those of a year ago (while intermediates have slowed), but the constraint exercised by higher prices may be expected to moderate the growth of private consumption expenditure in real terms. Public consumption expenditure expanded more slowly during the first half year and the Government has announced budget restraint, such that real growth in this component at around 8 per cent will be well below the 11 per cent of 1979.

57. Accounting for nearly a quarter of GDP expenditure in 1978 and 1979, gross domestic fixed capital formation continues to grow rapidly and is expected to have approximated the 19 per cent growth rate recorded in 1979. Investment in transport equipment and industrial machinery continues at high rates while that in construction was accelerating during the first three quarters of 1980. Although construction activity continued its rapid expansion, there were signs of deceleration in manufacturing production and the rate of growth of the workforce in manufacturing slipped back from its leading position in employment growth. In the services sector, the growth of tourism seems to have been slight during the first three quarters of 1980.

58. Heavily committed to external trade (with exports more than 40 per cent of GNP) and the export of manufactured goods, thus also vulnerable to the uncertainties of international financial and merchandise markets, the economy of the Republic of Korea has been subject to great uncertainty on the domestic scene since the death of President Park Chung Hee. The rapid pace of industrialization with its emphasis on heavy industry has generated internal strains, including exceptional inflationary pressure. High rates of inflation, extremely rapid increases in nominal wages, speculation in real estate and inventories during 1976-1978, and a fixed exchange rate contributed to a drastic deterioration of the competitiveness of the country's products in world markets.

59. A stabilization programme mounted in April 1979 to deal with the causes and consequences of the overheating of the economy embraced measures to correct structural imbalances, restore the function of the market mechanism and reduce inflation, including conventional tight monetary and fiscal policies. Although the monetary targets were approximated in 1979 by the reduction of the growth of money supply (both narrowly, M1, and broadly defined, M2) inflation continued to accelerate in that year and during 1980. On annual averages, consumer prices rose 14 per cent in 1978, 18 per cent in 1979 and 24 per cent in the 12 months to June 1980, while wholesale prices rose rather more rapidly. Relaxation of price controls as part of the stabilization programme and the rise in crude oil prices combined to subvert the anti-inflationary aims of the programme as domestic prices of petroleum products rose by more than 70 per cent during 1979 and by another 67 per cent between December 1979 and August 1980. Continued rapid increases in imports, including a sharply increased share for crude oil (from 15 per cent of the import bill in 1978 to 24 per cent during January-August 1980), and less rapidly increasing export earnings in 1979 nearly quadrupled the current account deficit to $US 4 billion in that year.

60. Exports adjusted for inflation declined by 2.5 per cent in 1979 while imports rose by nearly 10 per cent. Growth rates in all other GNP components were markedly lower than in 1978 with the sharpest declines in public consumption, which turned negative, and fixed capital formation. Real growth in GNP fell from over 11 per cent to less than 7 per cent. Preliminary estimates for 1980 show all expenditure components in decline (except exports, estimated to have expanded by nearly 9 per cent at constant prices) and a decline in GNP of some 4.5 per cent in real terms. Except for agriculture, growth in production sectors was markedly slower in 1979 than 1978 and during 1980 output from all major commodity-production sectors is estimated to have declined. The drastic decline in agricultural production and the considerable fall in industrial output mean a marked decline in the aggregate supply of physical goods, which is in no meaningful way compensable by an increase in the supply of services. Nor is it likely to be easily recovered by recourse to monetary and fiscal measures.

61. Policy changes during 1980 included a 20 per cent devaluation in January; under the régime of a managed float from the end of February, the won had depreciated by an additional 13 per cent vis-à-vis the US dollar by the end of November; its value is being determined daily against a basket of currencies of major trading partners. Interest rates were raised to reduce liquidity and offset the cost-push effects of devaluation while credit restraint continued. Fiscal restraint was relaxed in June, following the occurrence of open unrest and mounting unemployment, to provide funds for public works programmes and loans to small- and medium-scale enterprises also intended to create employment opportunities. Unemployment numbering 829,000 persons in the March quarter (5.7 per cent of labour force) had been reduced by 157,000 persons by the June quarter for an unemployment rate of 4.4.[7] Further measures were taken in September and November to relax controls on credit expansion, reduce interest costs to industrial borrowers, encourage exports and induce productive investment, which continued to fall sharply during the first half of the year. Lower levels of production appear to have permitted an appreciable slackening in the expansion of imports, and a decline has been recorded in quantum terms. Preliminary estimates for the full year indicate a somewhat more rapid expansion of merchandise exports than of imports (both in current US dollar prices), a larger deficit on invisibles and an estimated current account deficit exceeding $US 5 billion

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[7] In part the decline appears to be seasonal. The pertinent figures are:

		Unemployed		*Change*	
		Number (thousands)	*Rate[a] (percentage)*	*(thousands)*	*(percentage)*
1978	March . . .	501	3.6	—	—
	June . . .	406	2.7	—95	—19.0
1979	March . . .	562	4.0	61	12.2[b]
	June . . .	537	3.5	—25	—4.4
1980	March . . .	829	5.7	267	47.5[b]
	June . . .	672	4.4	—157	—18.9

Source: Bank of Korea, *Monthly Economic Statistics*, August 1980, table 96.

[a] Percentage of labour force.

[b] From preceding March quarter.

2. South Asia

62. Except for Sri Lanka, none of the economies of south Asia is as heavily dependent upon external trade as the market economies of southeast and east Asia. The greater measure of insulation from fluctuations in the international economy is flawed by the necessity to import critical items, most commonly oil and fertilizers and, in a poor crop year, substantial quantities of food-stuffs. Hence, the need persists to increase foreign exchange earnings, primarily by means of exporting. As a result of the extraordinary increases in petroleum prices in 1973-1974 and 1979-1980, the possibility of covering increased costs of imports by expanding commodity exports has effectively disappeared at least for the medium term. Dependence upon the performance of the international economy has thus assumed greater importance for virtually all developing countries as this performance determines the supply conditions for investment, credit and economic assistance, as well as the demand for commodities.

63. In the circumstances of incipient slowdown in the international economy, the growth performance of Sri Lanka, the most heavily export-dependent of the south Asian economies, has apparently begun to lose momentum. GDP (at constant factor cost) slipped from a growth rate of 8.2 per cent in 1978 to 6.3 per cent in 1979 and to 5.6 per cent, according to preliminary estimates, in 1980. Merchandise exports, which accounted for nearly 30 per cent of GDP in 1979, increased only marginally in 1980; preliminary estimates for that year are of the order of 8 or 9 per cent growth in real terms, despite reduced prices and volumes for coconut products, a minor decline for tea exports and a minor increase for rubber. Together these three products accounted for nearly two thirds of total export values in 1979. Industrial products, chiefly textiles, garments and refined petroleum products, have made the greatest gains during 1980.

64. Domestic demand in 1980, even more than during 1979, has retained momentum from an exceptionally rapid increase in fixed capital formation. Under conditions of rapidly accelerating inflation (24 per cent in consumer prices during the 12 months to September 1980 as compared with 10.8 per cent during calendar year 1979, according to the official consumer price index), estimation of the growth rate in fixed capital accumulation is difficult at best. Using the most accessible price information, it appears that real fixed investment expanded by more than 30 and perhaps as much as 40 per cent during the year. Gross fixed capital formation amounted to about one seventh of GDP (at current prices in 1977; under the new government policies for industrial and infrastructural development, that proportion rose to 20 per cent in 1978, 25 per cent in 1979 and, according to a preliminary estimate, 35 per cent in 1980. Adjustment of investment expenditures for price changes (domestic and imported components) suggests an increase in the rate of fixed investment by something of the order of two to two and a half times between 1977 and 1980. An increase of this order of magnitude has important implications for consumption expenditures and the balance of payments. In respect of the latter the sharply increasing trade gap and the mounting current account deficit indicate that the greater part of domestic investment is being financed through the balance of payments.

65. It appears that the extraordinary increase in real investment has been possible without a corresponding increase in real domestic savings, thus without sacrificing real consumption, at least until 1980. In the absence of full information on price developments in 1980, the growth of real consumption can only be crudely estimated. At current prices, private consumption expenditure increased at a rate somewhat greater than that of prices, while public consumption (about a tenth of total consumption in 1979) grew by only a fraction of that rate; total consumption thus appears to have risen at a rate only marginally higher than the rate of consumer price increase.

66. The very rapid expansion of the construction sector (in real terms, 20 per cent or more per year sustained over the past three years) is the most direct counterpart of the growth in investment demand. A major part of this growth is attributable to non-residential construction related to the large-scale Mahaveli irrigation programme. Growth rates in commodity production slackened in both 1979 and 1980 mainly as a result of the decline in plantation agriculture. Manufacturing output grew less rapidly owing to the decline in processing of agricultural export commodities; factory industry, which accounts for about half of manufacturing value added, grew more rapidly as demand increased and imported inputs were generally available, though at increasing prices. Rejuvenation of plantation agriculture and continued development of export-oriented industrial production will face increasing difficulty as export markets deteriorate during the coming year.

67. The over-all performance of Pakistan's economy recorded palpable improvement during 1979/80 with an increase in real GDP from 5.9 per cent in 1978/79 to 6.2 per cent, easily matching the annual plan target for the year. An important feature of this growth performance was the rise in the value added

in the commodity production sectors — agriculture, manufacturing and mining and quarrying — where value added increased by 6.7 per cent in 1979/80 as against 4.4 per cent in 1978/79, resulting in a rising share of the commodity producing sectors in the gross domestic product. The rate of growth of the agricultural sector, rising from 2.5 per cent in 1977/78 and 4.2 per cent in 1978/79, accelerated further to 6 per cent in 1979/80. Industrial growth was also substantially higher at 8.1 per cent during the year as compared with 4.8 per cent in 1978/79.

68. Following a marked deterioration in the previous year, balance-of-payments pressure continued during 1979/80 despite the substantial increase in exports. The government budgetary position showed appreciable improvement thanks partly to increased tax revenues and partly to economies in non-development expenditure and the phasing of development expenditure. Inflationary pressures were accentuated during the year and consumer prices rose at 10.4 per cent during the 12 months ending in September 1980, a percentage point above the rate during 1979. The continued high rate of monetary expansion, a pronounced increase in prices of imported goods, particularly petroleum products, and the rise in certain administered prices (to reduce the Government's subsidy bill) were the main factors responsible for the accentuation of inflationary pressures during the year.

69. Major components of domestic demand rose at increasing rates during 1979/80, in real terms somewhat more rapidly than commodity production. Incomes generated by accelerated export expansion outpaced the rate of absorption by import growth. Although fiscal restraint kept public consumption expenditure from growing rapidly, private consumption increased at moderately increasing rates. Production responded buoyantly to this expansion of domestic and export demand as bumper crops of wheat and cotton led the expansion in agriculture. Agricultural output increased by 6 per cent in 1979/80, well above the 4.2 per cent recorded in the preceding year. Industrial production also expanded at an increased rate, paced by large-scale manufacturing at more than 8 per cent, in comparison with less than 4 per cent a year earlier. Notable gains were recorded mainly in the production of intermediates: cotton yarn, cement, chemicals, fertilizers and mild steel products and more ample supplies of these inputs supported the growth of agriculture and the construction sector. Rapid and mildly accelerating growth in construction activity exceeded growth rates in manufacturing.

70. The economic scene in India was dominated by two major developments in 1979/80 (year ending in March): departure from the price stability enjoyed during the previous three years, with consumer prices rising by 8.6 per cent (against 2.1 per cent in 1978/79) and wholesale prices by 16.9 per cent (unchanged in 1978/79). Containing inflation became the major preoccupation of economic policy. However, the net accretion to the country's foreign exchange reserves ceased in that year as a record deficit of Rs 22.3 billion (about $US 2.8 billion) was incurred. A rough estimate of real national income in 1979/80 shows a decline of some 3 per cent, as the agricultural sector suffered a 10 per cent fall in output.

71. In contrast, performance during 1980/81 portends a recovery, particularly in agriculture, where production is expected to have increased by 10 to 12 per cent, and in industry (by 4 or 5 per cent). In real terms national income may expand by 6 or 7 per cent, but this anticipates a good *rabi* harvest and assumes substantial recovery in industrial production. Inflationary pressures have persisted, despite anticipations based on the influence of a favourable monsoon on crop outcomes and despite the success of monetary restraint in reducing the rate of credit and money supply expansion. External factors, especially the large increase in oil prices, have resulted in deterioration in the balance of payments and domestic inflation. Even when new loans and compensatory financing obtained in 1980 are taken into account, a sizable draw-down of foreign exchange reserves seems inescapable.

72. Although national accounts estimates for 1979/80 are not yet available, rough estimates yield a 3 per cent decline in real national income in that year, primarily the result of the sharp decline in agricultural production, in turn the consequence of severe drought. Industrial production stagnated and may have declined, mainly owing to fuel and power shortages and transport bottlenecks. The recovery during 1980/81 has been substantial only in agriculture, according to reports of the first half of the year (to September 1980); more recent information quite unmistakably indicates a bumper harvest, possibly exceeding the peak level of foodgrains production of 1977/78, or an increase of 10 to 12 per cent.[8] The anticipated recovery of industry remains in doubt, however; industrial production has not improved during the first half of the fiscal year. The Federation of Indian Chambers of Commerce and Industry estimates that industrial production was down by 3.2 per cent during the first six months of 1980/81.[9]

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[8] The Food and Agriculture Organization of the United Nations (FAO) total agricultural production index for India yields a preliminary estimate of nearly 15 per cent. FAO, computer printouts, 7 December 1980.

[9] Mohan Ram, "Nature's help is not enough", *Far Eastern Economic Review*, 28 November 1980.

73. On the basis of recent past performance of the Indian economy, with substantial recovery in agriculture virtually assured, even the occurrence of a 5 or 6 per cent decline in industrial production would permit meaningful recovery in GDP growth during 1980/81. On present indications a disastrous decline in industrial production is highly unlikely; the more likely range is a decline of 3 to 5 per cent for the fiscal year. With some two fifths of GDP produced in the agricultural sector and rather more than one fourth in industry (manufacturing about 17 per cent, in 1978/79), total commodity production would grow by something in the range of 4 to 5 per cent and GDP by 5 or 6 per cent; more favourable outcomes in either sector could well raise the rate of GDP growth by an additional percentage point.

74. Even in the event of only modest recovery in production, consumption demand may be expected to increase quite substantially in real terms as a consequence of a bountiful harvest. The greater part of the rest of aggregate demand is largely determined by public policy and realized in the form of public sector consumption expenditure and capital formation. In the circumstances, domestic demand scarcely appears as a constraint to a substantial increase in realized GDP in 1980/81. The external sector remains problematical, however. Exports have slumped since 1978, more sharply since mid-1979. Diminishing constructions activity in the Middle East has also reduced remittances from Indian nationals working abroad. The large share of essentials in the import bill (petroleum, its products and fertilizers account for about half) has meant that imports have risen rapidly since 1977 — after 1978 mainly because of the great increase in oil prices. The import bill accelerated sharply during the first half of 1980. Reserves have begun to be drawn down and external balance has become a critical problem for the Indian economy.

75. Early estimates of the growth in real GDP in Bangladesh during 1979/80 (year ending June) indicate a substantial recovery from the slow growth of the previous year; although at a rate of 6.1 per cent, the full momentum of growth in 1977/78 had not been fully recovered (8.1 per cent). During 1978/79 the growth of agricultural output increased by less than 2 per cent while that of manufacturing expanded by rather more than 4 per cent. Buoyed up by extremely rapid expansion of construction activity and in the production of power and gas, the broad industrial sector is reported to have grown by 9 per cent in 1978/79. Nevertheless, because of the predominance of agriculture in commodity production (80 per cent in 1977/78, and well over half of GDP), total commodity production expanded only slightly more than 3 per cent.

76. Severe drought in 1979 and 1980 hindered the expansion of food production; during the 1978/79 crop year, rice output increased by less than 4 per cent while the effects of the drought were felt in the succeeding season as output of this major cereal crop expanded by little more than 2 per cent. Although expansion of wheat production was exceptionally large, thanks to a very large increase in planted area as well as rising yields, rice by far predominates, accounting for half of agricultural value added and a quarter of GDP. The output of food agriculture as a whole grew by more than 4 per cent in 1979/80 while the index of non-food production showed a sharp decline.[10] According to recent reports, the manufacturing sector recorded very little growth during the full year 1979/80 despite a rapid, if only partial, recovery from the low levels of the preceding year. While the large-scale manufacturing sector grew by 1.3 per cent, small-scale industry production is reported to have declined.

77. Domestic demand at current prices has grown rapidly during the past three years (to 1979/80) and, despite high rates of inflation in the last two years, expansion in real terms has occurred as well. Total consumption expenditure accounts for all but a small fraction of GDP at current market prices; investment expenditure, heavily dominated by the public sector share, has risen at a decreasing rate under the guidance of annual, biennial and medium-term plans. In price-adjusted value, a substantial increase in investment has taken place but growth at a decreasing rate occurred during 1978/79 and 1979/80. As gross savings have persistently been a small fraction of GDP, the bulk of investment expenditure has been financed by an increasing deficit on current account in the balance of payments. Rising costs of critically necessary imports, pre-eminently foodstuffs and petroleum products, have contributed heavily to this development, which during 1979/80 has been exacerbated by a substantial fall in the terms of trade.

78. An increasing surplus in the Government's current budget has contributed to an ambitious annual development programme. Revised upwards during 1979/80, development programme expenditure apparently was not greatly increased as the current budget surplus declined and deficit financing was required to cover the shortfall in the total budget. The inflationary pressures resulting from this persistent pressure of aggregate demand against limited resources have been and remain a critical concern

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[10] FAO, computer printouts, 7 December 1980.

for the management of the economy. With the extreme increase in petroleum prices since 1978, the problem of external balance has become exceptionally onerous.

79. According to reports from Nepal, citing official sources, 1979/80 (ending 15 July) was a poor year for agricultural production and for economic performance generally. Production of foodgrains is reported to have declined by more than 13 per cent;[11] industrial output in the small, organized manufacturing sector appears to have stagnated. Exports have fallen off while imports have continued to rise; in consequence, the deficit in the balance of merchandise trade has greatly increased. Except for a sharp increase in food prices in 1977/78, consumer prices have been rising at moderate rates until last year. During the 12 months to June 1980, the consumer price index began to rise rapidly, at a rate of more than 12 per cent. Monetary demand expanded at an increasing pace as government revenues declined (for the first time in two decades) while expenditures increased; the expansion of credit to the private sector contributed rather more to the sharp increase in money supply. Rising prices and stagnant domestic production have in turn generated an increasing demand for imports, and the shortfall in the public budget has meant increased reliance on foreign aid.

80. Following a period of several years of moderate and irregular expansion of GDP, preliminary estimates for 1979/80 are for a slight decline in real gross product. Over the past five years, the average annual rate of growth in GDP has barely kept pace with population growth. As the agricultural sector accounts for about three fifths of GDP, the estimated decline in agricultural value added in 1979/80 (−4.8 per cent) has effectively pulled down the rate of aggregate growth, more than off-setting the 4 per cent increase in real value added by non-agriculture.

81. The performance of the agricultural sector thus largely determines the pattern of over-all performance. In the production of the predominant share of gross product, the sector provides a livelihood for more than 90 per cent of the population, supplies raw materials for processing and manufacturing and accounts for a major part of commodity exports. During the past decade continuous efforts have been made, under successive five-year plans, to increase productive efficiency, total output and the real earnings of the population in agriculture. The use of chemical fertilizers has increased fourfold, the use of improved seed has quintupled, 150,000 hectares of farm land have been brought under irrigation and credit availability to agriculture has increased, as have government outlays for agricultural development. Nevertheless, yields per hectare have not increased consistently and, with few exceptions, the pattern of yields in both food and non-food crops has followed a falling trend. The limited increases in total agricultural output that have been recorded over the decade are attributable to an expansion of the area under cultivation.

82. Public and private efforts to induce economic development have generated an increasing monetary demand, pressing upon a more slowly expanding capacity to produce while the situation has been steadily exacerbated by the rapid growth of population (about 2.3 per cent per annum). The isolated geographical position of Nepal not only restricts access to external markets but raises the real costs of the exchange of goods and services. Although external trade makes up only a small portion of total gross product, the level of development of domestic production requires key inputs which can only be acquired by importing; in recent years imports have been dominated by manufactured goods, ranging from consumption articles to capital goods. With the rapid rise in prices of manufactures and the exceptionally rapid increase in the cost of essential inputs — fuel, fertilizers and transport equipment — the terms of trade have clearly become less favourable, despite episodic increases in primary products export prices. The pattern of trade with India remains that of a raw materials producer exchanging primary products for manufactures. The decline in the share of exports going to India during the last three or four years reflects the decline in exports of raw materials and foodgrains and the diversion of rice exports to Bangladesh since the opening of the Radhikapur route early in 1978.

83. With very limited resources, an expanding demand for manufactured goods, and a stagnating surplus for export, the management of both the external balance and the domestic balance has become increasingly sensitive. In particular, the sharply increased cost of oil as well as the costs of other imports necessary for production and development have made the external balance exceptionally difficult, despite the minor share of external transactions in aggregate economic activity.

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[11] There are discrepancies between the national source data and the FAO series relating to production levels and changes in them in 1979/80. The most important of these are summarized as follows:

	Percentage change in 1979/80	
	National source	*FAO*
Paddy production	−12.0	6.9
Foodgrains production (index) (FAO: cereals)	−13.3	4.7
FAO agricultural production (index) . . .	. . .	3.7
Agriculture GDP (at 1974/75 market prices)	−4.8	. . .

The discussion in the text is based upon the data from the national source.

3. Pacific islands

84. The island countries of the South Pacific are typically small, with populations numbering in the tens of thousands; their economies include important subsistence sectors and provide few products for export. Dependent upon the distant outside world for a wide range of goods which they are unable to produce, their economic performance responds to the changing conditions of trade and of the weather. The largest of the island economies, Papua New Guinea (population 3 million) and Fiji (population 620,000), are scarcely representative of the group; Tonga, with a population of 10,000, is perhaps more typical of the smaller island economies.

85. Broad structural similarities among Fiji, Papua New Guinea and the much smaller Tonga include an agricultural sector relatively greater in workforce than in GDP, producing 40 per cent of GDP in Tonga, about 35 per cent in Papua New Guinea and rather more than 20 per cent in Fiji. Agricultural growth has slackened in Tonga during the last several years, with a decline in export crop production resulting from drought and storm damage in 1979; little improvement is expected in 1980. In Papua New Guinea, smallholder crops have continued to expand while plantation agriculture has languished. Fluctuation in sugar-cane production in response to weather conditions and large variations in export prices has meant irregular agricultural growth in Fiji, while the domestic-market segment has maintained fairly steady growth.

86. Non-agricultural commodity production is dominated by copper mining in Papua New Guinea (Bougainville), where output has declined since 1978 as the richer ores are being depleted. Manufacturing is small but has increased in relative importance. Manufacturing production in Fiji accounts for about one eighth of GDP but is heavily influenced by sugar milling, which fluctuates with the cane crop and export demand. Construction activity has been bolstered by public development projects as private residential building declined sharply in 1980. The small manufacturing sector in Tonga, including the processing of primary commodities for export, provides less than 10 per cent of GDP but has expanded rapidly up to 1978/79 despite the decline in export crop output; construction activity continues to rise rapidly.

87. In each of these economies the fortunes of commodity exports have a strong influence on domestic production. Export performance in turn has been affected not only by variations in export demand and prices but also by the capacity to produce. For agricultural export production, weather conditions — drought and violent tropical storms — have not infrequently reduced export capability. Domestic conditions and an overvalued domestic currency have in some cases discouraged the maintenance of production levels in export agriculture. During the last two or three years, the performance of merchandise exports has varied considerably from year to year and the experience of the separate economies has also varied. Thanks to the recovery of world sugar prices in 1979, Fiji's exports have flourished, rising by 29 per cent in that year and an expected 50 per cent in 1980 (in current prices). Tonga's merchandise exports decreased in 1978 by more than 20 per cent (in current prices) and only just recovered to nominal 1977 levels in 1979. With the sharp decline in world prices of copra and coconut products in 1980 and the consequent deterioration in the terms of trade, it is unlikely that exports will earn more than a year earlier. Commodity exports from Papua New Guinea are expected to decline marginally in 1980 as a result of reduced shipments of copper concentrate and unfavourable prices for cocoa, copra, coconut oil and palm oil.

88. Merchandise imports have risen rapidly during the last two or three years as import prices have escalated; the price of oil has played an important but generally not a predominant part. Trade balances have suffered in consequence, perhaps most seriously in Papua New Guinea where the necessity to import food-stuffs has persisted. The deficit in merchandise trade increased sharply for Tonga in 1978 and the prospects for a further decline in 1980 reflect export stagnation as well as rising import costs. For Fiji, however, though a negative trade balance persists, improved sugar export earnings in 1979 and the further rise in 1980 have meant some easing of the deficit on trade and on the current account. Tourism in Fiji, as measured by tourist arrivals, is expected to expand by 6 or 7 per cent in 1980; tourist receipts may rise much more rapidly even after adjustment is made for inflation.

89. Vulnerability to variations in export prices and the inability, for varied reasons including unfavourable weather conditions, to maintain output levels in agriculture have made for inconstancy in the growth of real product. Fiji and Tonga have recorded GDP growth rates of the order of 4 or 5 per cent a year for the past four years, with an abrupt increase for Fiji in 1979 resulting from the combination of a bumper crop of sugar-cane and very favourable movements in world sugar prices. Papua New Guinea's GDP has described virtually a zero-growth path for the past several years and the increase expected for 1980 will apparently be marginal. All three economies face production problems although

these are perhaps less acute in Fiji. Rising import costs have become increasingly difficult to accommodate and oil prices in particular have pushed up production costs. Domestic prices have begun to rise more sharply in all three countries beginning in 1979 and reached double-digit levels during 1980. Balance-of-payments difficulties are becoming acute for Papua New Guinea as import costs rise and export production falters, and are exacerbated by the necessity to import basic foods. Both Tonga and Fiji face deficits on current account which will require continued effort to be kept manageable.

III. GROWTH IN MAJOR PRODUCTION SECTORS

A. AGRICULTURE

90. The characteristic long-term trend in the agricultural sector of the developing countries of the Asia-Pacific region has been clearly delineated in various studies[12] to consist of a gradual rise in the rate of growth in value added concomitant with a process of diversification towards cash and non-food crops. Despite the sector's secularly rising growth rate, however, its share of GDP has been gradually declining as growth rates in other sectors have risen more rapidly. Associated with these trends are several key development issues. First, the persistent growth of population has tended to press on the rate of food output expansion, giving rise to national food security problems. Secondly, the far larger share of population dependent on agriculture than the share of agriculture in GDP has made this sector a major poverty reservoir, and the sector's relatively slow growth has tended to exacerbate this problem. Thirdly, the trend to cash cropping, and especially to export commodities, has increased the agricultural sector's sensitivity to price fluctuations and the economy's susceptibility to international market pressures. Developments within the agricultural sector in the ESCAP region during the past several years must be examined in the light of these secular trends and fundamental development issues.

1. Foodgrains

91. There is increasingly clear evidence for most countries of the region that improved water management, increased fertilizer use and the introduction and spread of high-yielding and pest-resistant varieties are having a beneficial impact on the size and certainty of foodgrain yields. Further improvements will be attainable in conjunction with appropriate institutional changes, particularly land reform, but with isolated exceptions recent years have continued to witness far more rhetoric than action.[13]

92. Despite the broadly acceptable underlying agricultural growth trend, the rate of growth of foodgrain output in developing countries of the region continues to show a trend considerably less than the 4 per cent target level advocated by the World Food Conference convened by FAO in 1974 (see table 10). With the rate of growth of foodgrains output for 1975-1980 averaging 3.3 per cent for these countries, it is only barely outstripping the rate of population growth. This has left little scope for substantial improvements in nutrition levels, although the markedly superior recent foodgrains output trends in India, Pakistan and Sri Lanka, among others, suggest that significant improvements are occurring — though admittedly from very low base levels — in some instances.

93. These regional trends continue to be masked over the short term by sharp year-to-year fluctuations and wide country-to-country variations in output due to uncertainties of the weather, pest infestations and the like. Thus, the relatively large 5 per cent increase in foodgrains output in 1978 for the region's developing countries was followed by a year of no change in 1979 and a return to moderate growth of 2.4 per cent in 1980. The record for 1979-1980, taken as a biennium and contrasted with 1978, represents a serious trough in the region's long-term foodgrains production trend. The fact that this shortfall did not eventuate in a foodgrain consumption crisis speaks well for the region's increasing capacity to administer foodgrain stocks and distribute them effectively as circumstances require.

94. The short-term variability of foodgrain output is thrown into sharper focus in year-to-year comparisons for individual countries. In the presence of drought conditions over much of south Asia, relatively poor weather in many others, and a return to normal conditions after exceptionally good harvests in yet others, foodgrain production declined or stagnated in most developing countries in the region in crop year 1979. The improved growth performance for 1980 should be viewed in the light of the poor 1979 experience, for it was in large part a recovery to long-term norms. Thus, India's high growth of 15 per cent in 1980 did little more than compensate for the 13 per cent decline in 1979. Similar performances are evident in the cases of Sri Lanka and Thailand, while the 1980 recovery in the growth of foodgrain output in Burma and Iran failed to compensate for the 1979 decline.

95. With respect to the region's major foodgrain crops, rice and wheat, the experience of the past few years reinforces the widely held view that over the long term the developing Asian countries are collectively strengthening their position, though at a decidedly slow pace (see table 11). The regional

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[12] See, for instance, "Growth performance and structural change", *Economic and Social Survey of Asia and the Pacific, 1978* (United Nations publication, Sales No. E.79.II.F.1), chapter 2.

[13] Recent progress with respect to one major area of institutional change in agriculture is reviewed in "Report on the implementation of resolution 196 (XXXV) on the role of the co-operative movement in the social and economic development of the developing countries of Asia and the Pacific" (E/ESCAP/199).

Table 10. Selected developing ESCAP countries. Growth rates in foodgrain production, 1975-1980[a]

Country	*Average 1975-1980*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*
West Asia							
Afghanistan	—2.3	3.2	3.1	—9.9	5.9	—16.0	—
Iran	—0.1	18.1	8.0	—16.9	—6.4	—6.1	2.8
South Asia							
Bangladesh	3.7	13.7	—7.8	11.2	—0.8	0.8	5.0
Burma	3.1	8.6	—	2.6	11.1	—5.4	1.6
India	5.9	20.8	—5.2	14.5	3.2	—13.1	15.0
Nepal	1.2	2.8	—2.7	—5.6	4.9	4.7	3.4
Pakistan	5.8	5.6	8.8	6.5	—3.0	11.8	4.9
Sri Lanka	4.9	—28.8	8.9	32.6	13.2	—4.6	8.1
South-east Asia							
Indonesia	3.6	—1.7	2.6	2.5	13.1	—0.7	5.8
Malaysia	1.4	—6.4	—0.9	—11.3	—31.4	60.0[b]	—1.8
Philippines	5.3	10.1	5.0	7.9	3.7	—0.7	5.7
Thailand	5.3	15.5	—3.4	—13.0	32.0	—6.8	7.3
East Asia							
China	2.8	5.2	1.6	—3.2	9.2	7.7	—3.6
Republic of Korea	—3.6	7.6	8.0	6.6	—2.3	—10.2	—31.6
Developing ESCAP	3.3	9.3	0.9	2.5	5.0	—	2.4

Source: FAO, computer printouts, 7 December 1980.

Notes: [a] From production index, 1969–1971 = 100.

[b] Figure overstates actual change in tonnage because weighted index includes paddy, which accounted for over 99 per cent of the total index. The percentage increase in paddy production in metric tons was 41.5 per cent in 1979 (FAO data); the corresponding figure calculated on the basis of national-source data is 19.2 per cent.

Table 11. Developing ESCAP countries. Rice and wheat production, 1976-1980

	Production (thousand metric tons)					*Growth rates (percentages)*			
	1976	*1977*	*1978*	*1979*[a]	*1980*[b]	*1977*	*1978*	*1979*	*1980*
					Rice[c]				
Bangladesh	11 811	13 025	12 913	12 968	13 199	10.3	—0.9	0.4	1.8
Burma	6 151	6 245	6 930	6 600	6 732	1.5	11.0	—4.8	2.0
China[d]	90 338	90 629	96 741	100 287	98 350	0.3	6.7	3.7	—1.9
India	42 056	52 697	53 856	42 688	54 027	25.3	2.2	—20.7	26.6
Indonesia	15 845	15 876	17 525	17 918	19 312	0.2	10.4	2.2	7.8
Pakistan	2 751	2 964	3 288	3 319	3 216	7.7	10.9	0.9	—3.1
Philippines	4 264	4 551	4 830	4 620	4 904	6.7	6.1	—4.3	6.1
Republic of Korea	5 215	6 116	6 013	5 674	4 320	17.3	—1.7	—5.6	—23.9
Thailand	9 945	9 188	11 570	10 322	11 220	—7.6	25.9	—10.8	8.7
Viet Nam[d]	8 091	7 293	6 727	7 197	7 370	—9.9	—7.8	7.0	2.4
Others	6 123	6 285	5 857	5 608	6 290	2.6	—6.8	—4.2	12.2
Developing ESCAP	202 590	214 869	226 250	217 201	228 940	6.1	5.3	—4.0	5.4
Percentage of world total	85.0	85.5	86.2	85.3	86.1				
					Wheat				
Afghanistan	2 936	2 652	2 813	2 200	2 200	—9.7	6.1	—21.8	—
China[d]	50 001	45 001	52 002	60 003	56 002	—10.0	15.6	15.4	—6.7
India	28 846	29 010	31 749	34 982	32 000	0.6	9.4	10.2	—8.5
Iran	6 044	5 517	5 700	5 000	5 200	—8.7	3.3	—12.3	4.0
Pakistan	8 691	9 144	8 367	9 944	10 800	5.2	—8.5	18.8	8.6
Others	1 084	1 121	1 307	1 456	2 212	3.4	16.6	11.4	51.9
Developing ESCAP	97 602	92 445	101 938	113 585	108 414	—5.3	10.3	11.4	—4.6
Percentage of world total	23.0	23.6	22.7	26.8	24.9				

Source: FAO, computer printouts, 7 December 1980.

Notes: Production data are allocated to the calendar year during which the major part of the crop is harvested. The figures do not always match those published in national sources.

[a] Revised estimates.

[b] Preliminary estimates.

[c] Milled rice equivalent.

[d] Unofficial estimates.

trends for rice and wheat for the period since 1976 show growth rates of 3.2 and 3.0 per cent, respectively. These growth rates have permitted the developing ESCAP countries to retain, and even slightly increase, their dominant position in world rice production while continuing their effort to diversify into wheat, thereby steadily increasing their share of world production of this foodgrain.

96. The shortfalls of 1979 were concentrated largely in the rice harvest, with India's output declining by 20.7 per cent from the preceding year, Thailand's falling by 10.8 per cent and Burma's, the Philippines', the Republic of Korea's and various others' being reduced by smaller percentages. The improved harvests of 1980 showed a healthy region-wide growth of 5.4 per cent. Particularly important was India's recovery with a 26.6 per cent output increase over the previous year, which permitted the Government to replenish seriously depleted food stocks. Indonesia, the Philippines and Thailand also recorded substantial gains to aid them in combating their serious inflationary pressures in consumer goods markets. This general improvement found several exceptions. The most important was China, the region's largest producer, which, despite its expansion of rice production in 1979 while neighbouring countries were facing difficulties with this crop, encountered a 1.9 per cent decline in 1980 while its neighbours were more than recouping their losses of the preceding year. Another important producer, Bangladesh, has since 1978 continued to record a rice production growth rate inadequate to meet its growing consumption requirement, thereby increasing its chronic deficit position in this vital crop.

97. The region's record for wheat production in 1979 and 1980 contrasted with that for rice. While output continued to grow sharply in 1979, a decline was encountered in 1980. China and India, the region's largest wheat producers (accounting for over four fifths of the region's output), both contributed to this volatile record by achieving record harvests in 1979 followed by sharp reductions in 1980 owing to drought. Pakistan, another country in which the wheat harvest plays an important domestic role, continued its outstanding performance of 1979 with a reduced but still sizable increase in 1980. The case of Bangladesh is of particular interest. Concurrent with considerable shortfalls in the rice harvest, substantial progress has been made in diversifying towards wheat.[14] Wheat is fast becoming a major foodgrain and its production more than doubled in 1979/80 to reach about 1.2 million tons, with further optimistic predictions for 1980/81.

2. Other crops

98. While recent (1975-1980) foodgrain production in the developing ESCAP region has shown an annual compound growth rate of 2.1 per cent, total food production has been rising by 2.6 per cent per annum (see table 12). Non-cereal food crops, consisting primarily of sugar, legumes, roots and tubers, pepper, coffee, cocoa and tea, have thus been expanding considerably faster than foodgrains. This expansion doubtless reflects the success of policies for agricultural diversification as well as the inducements offered by buoyant world markets for certain non-cereal food-stuffs in recent years. It also reflects the need to adopt new crops as the expanding agricultural population brings relatively inferior tracts under cultivation.

99. One of the advantages of diversification into non-cereals is the reduced sensitivity of most of these crops to variations in weather. While the annual growth rate of foodgrain output in the region has since 1975 ranged from a high of 9.3 per cent to a low of zero growth, the influence of non-cereal food production has reduced the fluctuations of total food output to a peak of 6.4 per cent and a low of 1.6 per cent. In part of this reason, total food output for such countries as China and India fluctuated far less during 1979 and 1980 than the production of foodgrains.

100. The recent performance of non-food crops, however, has been rather volatile, largely in response to sharp fluctuations in world prices for such commodities as copra and coconut oil, palm oil, lumber and logs, cotton, jute and natural rubber (see table 13). For the region as a whole, the annual growth rate for non-food crops declined in 1979 to half the 5.3 per cent rate of the preceding year, and in 1980 it declined further to zero growth.

101. Depressed world market conditions for jute and kenaf caused difficulties in the region's leading jute-producing countries. In Bangladesh, jute production stagnated in 1979/80, equalling the 1977/78 output level and falling more than 7 per cent below the somewhat better performance of 1978/79. The decline was reinforced by the favourable rice price, which stimulated farmers to convert land from the country's principal export crop to its main domestic staple, reflecting Bangladesh's chronic dilemma in setting the optimum trade-off point between balance of payments and food security. In Thailand, there was a similar tendency to convert land from the cultivation of other crops into cassava, which enjoyed very favourable world market conditions in 1980, thus bolstering the country's export performance. In India, jute production is estimated to have fallen

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[14] Data given in *Bangladesh Economic Survey, 1979–80,* chap. 2, table 1, p. 5 show declines in rice production of 2.1 per cent in 1978/79 and 2.8 per cent in 1979/80, which do not appear in the FAO data presented in table 11.

Table 12. Selected developing ESCAP countries.
Key agricultural growth rates, 1975-1980[a]
(a) Food (b) Non-food (c) Livestock production

		Compound rate 1975-1980	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*[b]
West Asia								
Afghanistan . . .	(a)	−0.7	3.5	6.0	−8.9	6.2	−7.5	1.8
	(b)	−6.2	12.4	—	1.5	−5.1	−9.9	−14.4
	(c)	3.2	2.0	6.9	2.8	2.7	1.7	1.7
Iran	(a)	1.8	4.9	10.2	−4.3	3.7	−2.1	2.2
	(b)	−5.0	−28.1	9.8	4.0	−1.9	−14.6	−18.2
	(c)	4.7	4.2	9.6	1.5	8.6	2.0	1.9
South Asia								
Bangladesh . . .	(a)	2.1	11.2	−5.5	7.8	2.7	1.8	4.3
	(b)	4.0	2.6	10.1	18.4	12.6	—	−17.2
	(c)	7.3	1.0	5.0	1.9	26.2	3.7	1.4
Burma	(a)	3.1	—	2.8	3.7	5.3	0.8	2.5
	(b)	2.9	−0.8	−29.2	37.6	17.9	−2.2	2.2
	(c)	2.6	1.9	4.6	1.8	1.7	1.7	3.3
India	(a)	1.6	14.1	−2.7	9.1	3.3	−7.3	6.1
	(b)	3.3	−6.9	−0.9	8.4	11.2	−3.9	2.4
	(c)	1.1	1.9	1.8	1.8	0.9	—	0.9
Nepal	(a)	1.1	2.8	−0.9	−4.5	3.8	3.7	3.5
	(b)	2.8	6.6	4.9	15.3	2.0	−9.0	2.2
	(c)	1.4	1.8	1.8	1.8	0.9	1.7	0.8
Pakistan	(a)	3.7	1.8	5.2	5.0	0.8	3.9	3.8
	(b)	5.8	−14.8	−17.4	29.6	−9.8	39.8	−1.7
	(c)	2.6	3.5	3.4	2.5	2.4	2.3	2.3
Sri Lanka . . .	(a)	3.5	3.5	5.1	2.4	7.9	−1.5	3.7
	(b)	0.2	—	−3.3	2.2	—	4.4	−2.1
	(c)	2.2	3.0	4.9	3.7	−1.8	0.9	3.6
South-east Asia								
Indonesia . . .	(a)	3.2	0.9	−1.7	7.9	1.6	4.0	4.6
	(b)	−1.1	16.8	2.5	−13.2	6.7	2.7	2.6
	(c)	3.7	3.0	11.8	5.3	3.1	−3.0	−1.9
Malaysia	(a)	5.2	1.6	4.8	2.3	−3.0	16.9	5.9
	(b)	1.5	−3.3	9.5	−0.8	—	—	−0.8
	(c)	3.1	4.3	3.3	4.8	3.0	0.7	3.7
Philippines . . .	(a)	3.0	7.6	8.7	2.2	2.8	−1.4	2.8
	(b)	4.0	32.5	−2.6	—	12.9	9.6	1.1
	(c)	2.8	2.4	0.8	−3.1	9.5	4.3	2.8
Thailand . . .	(a)	4.3	9.9	5.3	1.4	23.2	−8.0	1.9
	(b)	4.4	−2.0	3.0	3.9	11.2	3.4	0.8
	(c)	4.2	3.8	5.5	4.3	4.2	4.0	3.1
East Asia								
China	(a)	3.0	3.5	3.4	−0.8	5.7	6.2	0.7
	(b)	1.6	−4.0	−1.7	−1.7	6.1	2.5	3.2
	(c)	4.3	4.2	4.8	3.8	3.0	5.0	4.8
Republic of Korea .	(a)	2.8	13.4	10.2	10.7	3.9	1.2	−10.4
	(b)	2.6	3.8	9.3	5.6	−3.2	−2.8	4.5
	(c)	9.4	12.8	10.0	13.9	4.3	15.3	4.0
Developing ESCAP .	(a)	2.6	6.4	1.7	3.4	4.1	1.6	2.3
	(b)	2.2	−3.5	—	3.6	5.3	2.5	—
	(c)	3.6	3.4	4.2	3.2	3.1	3.8	3.6

Source: FAO, computer printouts, 7 December 1980.

Notes: [a] From production indexes, 1969–1971 = 100.

[b] Preliminary estimates.

Table 13. Developing ESCAP region. Changes in export prices of agricultural commodities,[a] 1977-1980p
(Annual and quarterly percentage changes)

	1977	*1978*	*1979*	*1980*p	*1980*			
					I	*II*	*III*p	*IV*p
Agricultural commodities	23.4	−0.1	16.3	11.6	4.2	−1.6	2.2	0.5
Food-stuffs	36.6	−17.5	4.5	34.7	6.7	11.8	2.5	1.0
Wheat	−25.6	20.3	24.7	7.3	−3.8	−4.9	5.2	9.8
Rice	8.3	25.6	−6.1	31.5	9.6	6.1	2.5	2.4
Maize[b]	−7.0	—	28.8	25.2	4.7	8.0	14.0	5.1
Coffee	75.0	−34.9	6.1	—	−8.0	3.9	−9.8	−10.1
Cocoa	136.0	−31.8	−6.2	−18.9	2.2	−16.7	−9.7	4.0
Tea	78.6	−20.5	−0.6	5.1	−4.0	0.6	−1.2	—
Pepper	36.6	−9.4	−8.0	5.2	0.8	—	−2.5	6.8
Sugar	−29.8	−2.5	23.1	183.3	43.9	41.0	14.9	5.8
Agricultural non-food	14.8	12.5	22.9	0.5	−14.2	−8.9	1.9	0.3
Copra	46.3	16.5	42.9	−32.3	−8.0	24.0	4.8	−9.8
Coconut oil	39.0	21.6	40.8	−34.0	−2.5	−24.2	−4.0	−4.9
Palm oil	28.7	14.0	13.0	−14.1	0.9	−11.7	−8.8	−3.2
Lumber	9.3	10.1	19.0	4.7	−0.6	−8.0	11.1	5.0
Logs	26.2	13.4	32.8	30.8	6.5	8.9	5.3	2.4
Cotton	−3.8	−1.6	6.4	16.5	11.0	−1.3	4.0	5.2
Jute	7.2	23.6	0.9	−7.2	2.9	−0.9	—	−12.3
Natural rubber[c]	1.8	13.4	21.5	11.6	18.0	−11.2	−1.3	0.7
Tobacco	8.8	6.3	10.2	5.4	—	0.7	1.5	0.7

Sources: United Nations, *Monthly Bulletin of Statistics,* December 1980; International Monetary Fund, *International Financial Statistics,* November 1980; and national sources.

Notes: [a] Derived from index numbers, 1975 = 100; chiefly from table 59 of the first source. Third and fourth quarter figures from current sources. Group totals are weighted averages based upon 1975 export values from developing ESCAP economies.

[b] Bangkok export price, yellow maize.

[c] Malaysian Rubber Exchange, ribbed smoked sheet no. 1 (RSS–1).

p Provisional.

by nearly 10 per cent in 1979/80. Government assistance to producers in India led to a massive increase in stocks during 1980 in the presence of sluggish world demand.

102. The world sugar economy encountered a dramatic year in 1980, with sugar export prices rising by over 180 per cent for the year as a whole, beginning to level off only during the fourth quarter. The explosive market situation was generated by initial low stocks, followed closely by bad weather in several producing countries (China, Fiji, India and Thailand, as well as certain major producers outside the region) resulting in crop shortfalls. Thailand's 1979/80 crop was particularly poor, showing a 56 per cent decline from the previous year's level of 1.8 million tons, with expectations that the next year will show no improvement. India's 1979/80 crop was also unusually low, estimated at 4.9 million tons, roughly three quarters of the preceding year; indications are that the 1980/81 harvest will rise to near the former level. Output in Indonesia in the 1979/80 crop year, however, was slightly ahead of the preceding year's harvest. The Philippines produced only slightly below expectations in 1979/80 and is expected to continue at the planned level in 1980/81. Pakistan, which had suffered set-backs in recent years, estimated a 15 per cent increase in sugarcane production in 1980/81 as compared with the preceding year. In Fiji, the 1980 crop was estimated at 3,550,000 tons, representing an 11 per cent decline from the preceding year.

103. Tea production was slightly down in India in 1979 owing to dry weather conditions. There was little change from earlier years in Sri Lanka despite government incentives to boost output. India's exports fell in 1979 not only owing to the reduced level of output but also because of a substantial increase in domestic consumption, up by more than 6 per cent over the previous year. The situation was not improved by the fact that export prices stagnated in 1979 and rose at a slow pace in 1980, slow indeed considering the context of world-

wide inflation but more rapid than other beverage crops. Tea production in Sri Lanka declined in 1980 by an estimated 3 per cent from the preceding year despite government efforts to increase output. Sri Lanka's poor performance in 1980 was in part due to drought conditions during the first half of the year, but can be attributed more fundamentally to structural and other factors such as continuing management and labour problems on the State-owned plantations.

104. It has been estimated that world palm oil production increased by 12 per cent while coconut oil output rose by 8 per cent in 1980. Malaysia accounted for the largest share of the palm oil crop increase while the Philippines, followed by Indonesia and Sri Lanka, furnished the bulk of the increase in coconut oil. These increases followed similar rises in 1979, creating a downward price reaction in 1980 amounting to an estimated 14 per cent for palm oil and 34 per cent for coconut oil. As a result, there were indications towards year's end that coconut harvesting was being sharply curtailed in some producing countries. Of particular interest in the palm oil industry is Malaysia's rapid rise to market dominance in recent years. In 1977 Malaysia exported 56 per cent of internationally traded palm oil; this figure rose to 69 per cent in 1978 and 88 in 1979, placing the country in an even more commanding position with respect to this commodity than it had already achieved in the natural rubber industry.

105. The natural rubber market weakened in 1980 as auto tire production and industrial uses declined with the economic slowdown in industrial countries. Early estimates that total production would reach 3,970,000 tons, up from 3,850,000 tons in 1979, were modified downwards. Late 1980 estimates for Malaysia, for instance, indicated that rubber production might decline by as much as 100,000 tons below the predicted level, owing in part to conversion of rubber land to oil palm. One step towards the revitalization of Sri Lanka's stagnating rubber industry was the negotiation of a World Bank loan for the replanting of 47,000 acres of rubber. Given the industry's strong competitive gains during the 1970s as a result of the oil price inflation and the accompanying rise in the cost of synthetic rubber, the stagnation of the past year has not had serious consequences on smallholder producers.

106. In the timber industry, the continuing rapid rise of prices for logs and a slower rise for lumber reflect the rapidly diminishing supplies as well as buoyant demand. Recent high rates of timber extraction can scarcely be considered in the producing countries' development interest. A marked decline in Malaysia's rate of timber production in 1980, with output of logs down by more than 10 per cent over the first half of the year, resulted chiefly from the implementation of forest resource conservation policies. Several countries in south-east Asia have permitted extensive over-cutting in recent years such that reforestation on a massive scale will require decades to restore the forest cover to ecologically acceptable levels.

107. In addition to these major export crops, certain crops showed marked developments in individual countries. For instance, cassava, which in recent years has grown into one of Thailand's major agricultural exports, recorded an increase in output in 1980 of nearly 50 per cent in response to buoyant market conditions after suffering a minor decline in 1979 under adverse weather conditions. Similarly, Pakistan has made appreciable gains in cotton production in recent years; despite a small set-back in 1979 because of weather, production expanded by approximately 40 per cent between 1976 and 1980, making this one of Pakistan's most rapidly expanding agricultural products. Lastly, the coffee industry has in recent years begun to revive Asia's traditional role as a major coffee producer in world markets. Among the countries producing increasing quantities of coffee in the late 1970s were India, Papua New Guinea and Thailand, while Indonesia has emerged in the past several years as the world's leading exporter of robusta coffees. The stagnation of coffee prices since the peak in 1977 has at least temporarily reduced the earnings potential of coffee exports.

B. INDUSTRY

1. The longer view

108. As a "dynamic instrument of growth" because of its linkages with other sectors and the material and social benefits it creates and induces, the process of industrialization is crucially necessary in the developing countries[15] Viewed over a period of nearly two decades, the industrial sector in 10 or 12 developing economies of the ESCAP region may be said to have displayed a considerable degree of dynamism. Granted that this is a biased sample, comprising only those for which data are available and thus the economies with relatively important industrial sectors, industrial growth rates over the period 1960-1978 have typically exceeded those in GDP and often by a large margin (see table 14). By the late 1970s the broad industrial sector contributed 25 to 35 per cent of GDP; this share had typically been less than 20 per cent in 1960. Rates of growth

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[15] United Nations Department of International Economic and Social Affairs, *Shaping Accelerated Development and International Change* (ST/ESA/105).

Table 14. Developing ESCAP economies. Industrial growth in output and employment, 1960-1978

(Percentage per year)[a]

	Growth in gross product			*Employment growth*	
	GDP	*Industry*			
		Total	*Manufacturing*	*Total*	*Industry*
South Asia					
Bangladesh	3.3	7.0	6.0	2.4	10.1
Burma	3.2	3.5	3.7	1.9	5.4
India	3.6	5.0	4.7	1.6	1.6
Pakistan	5.7	7.7	6.8	2.1	2.4
Sri Lanka	4.1	5.0	4.0	2.1	2.5
South-east Asia					
Indonesia	5.4	7.8	7.3	1.9	3.8
Malaysia[b]	7.1 (7.8)	(9.6)	(12.3)	2.9 (3.0)	4.5
Philippines[c]	5.8	7.7	6.8	3.7	3.3
Singapore	8.7	10.7	11.3	2.7	5.6
Thailand	7.9	11.0	11.2	2.5	6.5
East Asia and the Pacific					
Hong Kong[b]	9.2 (9.2)	(6.2)	(5.6)	3.0 (3.0)	3.6
Republic of Korea	9.0	16.9	17.7	2.9	11.3

Source: World Bank, *World Development Report, 1980*, tables 2, 3 and 19.

Notes: [a] Compound annual rates.

[b] Figures in parentheses: 1970–1978; for Hong Kong manufacturing, 1970–1977.

[c] Source: National Economic and Development Authority.

in manufacturing over the long period have exceeded those of industry in fewer than half the economies covered. These include only Burma (and the differential is small) among the south Asian economies, and Malaysia (for 1970-1978), the Republic of Korea, Singapore and Thailand in east and south-east Asia. The relatively slower growth of manufacturing than that of the broad sector of which it constitutes the largest part does not necessarily imply a want of dynamism. In Indonesia, for example, the exceptionally rapid growth of mining (including petroleum extraction) since 1969 has overshadowed the growth of manufacturing. In other countries, rapid expansion of construction activity and value added has quite commonly exceeded manufacturing growth. In consequence of rapid and sustained growth, the manufacturing sector has typically increased its share in gross product. By the late 1970s this sector contributed a fifth to a quarter of GDP in five economies (Hong Kong, Philippines, Republic of Korea, Singapore and Sri Lanka) and a sixth in four more (India, Malaysia, Pakistan and Thailand); in 1960, in only three had the sector contributed as much as one sixth of GDP (Hong Kong, Philippines and Sri Lanka).

109. Although manufacturing activity appears to have lost dynamism in several countries during the 1970s, this is in several instances attributable to the element of scale; from a very small base (in 1960) high annual rates of expansion are more likely than from a large base. Nevertheless, there appear to be a few economies in the region in which the development of the manufacturing sector has indeed lost momentum and where policy reorientation seems to be required.

110. The most frequently cited shortcoming in the development of manufacturing industry has been the failure of such industrial growth to generate sufficient additional employment opportunities. Reference to table 14 clearly shows that employment in the industrial sector has grown significantly more rapidly than total employment in virtually all the economies for which data are available. Meanwhile, in all but a few of these economies urban unemployment has continued to grow. A comparison of growth rates in industrial employment and those in industrial production reveals that the latter have typically been considerably greater; thus, growth in value added generally exceeds growth in employment

in industry. Although the obvious inference is not incorrect, namely, that expansion of production failed to achieve sufficiently rapid employment growth, a further observation is necessary. In broad terms, the more rapid growth of output than employment reflects increased output per head of employed workforce and, by implication, rising levels of productivity. While there may be room for disagreement regarding the relative importance of increasing productivity in the process of industrial development, it must be apparent that the two aims are in conflict and that as a matter of policy some workable compromise must be achieved.

2. Recent growth performance

111. The growth of manufacturing production reported for recent years (see table 15) presents a varied pattern but one not entirely wanting in dynamism. Of the 10 countries for which available data permit a comparison, manufacturing growth during 1976-1979 was measurably faster in eight than during the first half of the decade. Although the early 1970s included two or three years of rapid growth, they ended in a sharp recession. It is perhaps noteworthy that moderately buoyant recovery of manufacturing activity has been possible since the 1974-1975 recession.[16]

112. Manufacturing growth in south Asia has fluctuated broadly in correspondence with the fortunes of agriculture, and for related reasons: commonly raw material and power shortages and variation in farm incomes. Except for Burma, manufacturing growth slackened quite markedly in 1979. Information pertaining to 1980 (1979/80, the year ending in June for Bangladesh and Pakistan), though as yet partial and provisional, suggests some improvement over the performance during 1978/79. As noted earlier (in chapter II) a possible downward revision of the provisional 9.2 per cent growth estimate for manufacturing in Bangladesh may be necessary when final returns are in; it appears unlikely that production in 1979/80 will have attained even the low growth rate reported for the preceding year.

Table 15. Developing ESCAP economies. Growth in manufacturing production, 1975-1980

(Annual percentage changes)

							1980[b]	
	1970-1975[a]	1976	1977	1978	1979	1980	First quarter	First half
South Asia								
Bangladesh[c]	...	1.1	11.7	9.7	1.7	9.2[d]		
Burma[e]	1.6	7.6	7.2	3.2	8.1			
India	3.2	9.0	6.4	6.9	—		—3.2	—0.1
Pakistan[c]	3.7	—0.6	—2.3	10.0	3.0	8.4	9.7	
Sri Lanka	0.6	4.8	1.1	12.0	5.1	8.0[d]		
South-east Asia								
Indonesia	...	9.0	14.7	16.8	10.3			
Malaysia (Peninsular)	10.7	18.9	10.6	9.7	9.5	11.0[d]		
Philippines	6.0	7.0	2.8	4.5	4.3		4.2	4.2
Singapore	11.2	12.0	9.2	11.6	14.5		14.4	13.5
Thailand[f]	11.7	15.6	13.0	9.8	10.0	9.4[d]		
East Asia and Pacific								
Republic of Korea	23.2	31.8	20.4	23.8	12.1		—2.2	—2.3
Fiji	1.7[g]	7.2	15.5	—1.1	25.1			

Sources: United Nations, *Monthly Bulletin of Statistics*, December 1980, table 10, and national sources.

Notes: [a] Compound annual rates based on indexes of manufacturing production, except as noted.

[b] Upon the corresponding period in 1979.

[c] Year ending June.

[d] Provisional.

[e] Year beginning April.

[f] Value added at constant prices.

[g] 1972–1975.

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[16] Although neither an index of manufacturing production nor value added by manufacturing (in constant prices) is available for Hong Kong, there is ample evidence that manufacturing, pre-eminently for export, has grown rapidly since 1975.

113. Both Pakistan (1979/80) and Sri Lanka (1980) have enjoyed healthy increases in the pace of manufacturing growth during the past year. Although the estimate for Sri Lanka is preliminary, it is clear that production for export (textiles and garments especially) has been important in the increase in factory production. Poor returns in traditional plantation crops (coconuts, rubber and tea) have resulted in a sharp decline, estimated at some 12 per cent in the output of agro-processing activities. Data for Burma are lacking but moderately good harvests (see the FAO estimates reported in the section on agriculture above) and the maintenance of export capacity sufficient to ensure the imports of necessary inputs for manufacturing may be expected to support manufacturing growth. Preliminary estimates suggest that manufacturing growth failed to reach the ambitious 13.8 per cent target for 1980/81 (year ending in March) and fell below the 8 per cent reported for 1979/80.

114. The performance of manufacturing activity in India in 1980/81 is still unclear. While unofficial reports have suggested a rate of 4 to 5 per cent growth, thus a distinct improvement over the stagnation during 1979/80 (see table 15, where zero growth is reported for 1979), available information (also incomplete) presents the distinct possibility of a decline. Despite an expected bumper harvest which will provide ample raw material inputs and increased demand from higher farm incomes, critical shortages have persisted during the first half year (to September 1980) in power, transport capacity, coal and some industrial inputs (see chapter II above).

115. Following a year of generally rather good performance in manufacturing among the economies of east and south-east Asia during 1979, a moderate slackening of the pace of manufacturing growth occurred in 1980. In the Republic of Korea, where a series of domestic difficulties — accelerating inflation, serious unemployment and social unrest — coincided with sharply rising costs of imports (pre-eminently petroleum), manufacturing production fell by several percentage points, the first time in two decades. In Peninsular Malaysia, early estimates of the year's performance indicated a rise from the 9.5 per cent of 1979 to about 11 per cent in the index of manufacturing production; exports of manufactures rose considerably more rapidly than total exports (at current prices) providing a helpful fillip to export growth as overseas sales of primary products began to flag. Reports from Singapore and Hong Kong describe continued rapid expansion of manufacturing output during the first half year but a distinct slackening of pace beginning in the third quarter. Mainly responsible for this deceleration was a slowdown in overseas demand as manufactured goods are heavily predominant in the domestic exports of these urban economies and export demand commands the dominant part of locally produced manufactures. The pace of growth of manufacturing in the Philippines has been moderate during the past several years (on average 4 or 5 per cent per year since 1976) and the anticipation of a modest increase, in part owing to more buoyant export demand, does not necessarily imply rapid acceleration. Despite the moderate improvement in manufactures exports and the over-all growth of manufacturing production in the Philippines, recently renewed efforts to encourage export-oriented production may have come at an inauspicious time as industrial growth and import demand in the developed market economies have begun to fade.

116. Some recovery of momentum in Indonesian manufacturing production following the damping effect of the November 1978 devaluation was becoming noticeable during the latter half of 1980. Rapid inflation during 1979 and 1980 (on average about 20 per cent in consumer prices in both years) has apparently begun to alleviate the cost squeeze that devaluation imposed upon producers heavily dependent on imported inputs. Indonesian manufacturing is predominantly oriented to the domestic market; with rising money incomes and more costly imports in terms of the devalued rupiah, producers of goods using domestic inputs seem to have had little difficulty in maintaining sales and production levels. The production of mass consumption goods — textiles (despite cotton import requirements), bicycle tires, matches, dry cell batteries, cooking oils, soaps and detergents — and important intermediates, such as paper, urea fertilizer and construction materials (cement, steel reinforcement rods, galvanized sheet, steel pipe) have been well maintained throughout 1979 and apparently during 1980.

117. Among the Pacific island economies, Fiji can boast a not inconsiderable manufacturing sector, accounting for 11 or 12 per cent of GDP and some 18 per cent of total wage and salary employment (but only about 8 per cent of the total working population, including the subsistence sector). Sugar milling accounts for two fifths of the gross value of manufacturing output and food, beverages and tobacco products provided 46 per cent of manufacturing value added (at current prices according to the industrial census of 1977). The pattern of manufacturing growth thus reflects the fortunes of sugar, Fiji's leading export, and this has clear seasonal and cyclical elements. In 1979 the sharp rise in the index of manufacturing production derived from a bumper crop of sugar, rising export prices and

earnings. The low rate of increase, about 3 per cent, reported for the first two quarters of 1980 (off-season and early processing season for sugar) is not likely to be an adequate indicator of the production pattern for the full year.

3. Issues and policies in industrial development

118. Critical issues of industrial development policy do not exist in isolation from the broader issues of development policy. Yet certain issues may be especially germane to manufacturing industry because of its special characteristics and its critical function as an "instrument of development". Such is the concern for the employment-creation attributes of manufacturing growth; similarly, the role of manufactures exports is of central importance for a national policy to increase foreign exchange earnings. The effort to accommodate the cost pressures caused by the oil price rises of 1979 and 1980 has its special problematics in an industrial setting. During the limited period of the year or two under review there is small possibility of monitoring and reporting the experience of new departures in policy as such developments require considerable periods of time to reveal themselves in forms which may be taken as definitive.

119. A major issue pertinent to industrial growth which has drawn particular attention during the past year or two as unemployment has grown to threatening proportions in many of the industrialized countries that normally import manufactures from developing countries relates to the barriers to the expansion of such exports. Despite the intensification of unemployment in the industrialized West and the recurrent calls from industrialists and labour unions for sharpened protectionist measures against the threat of cheap labour in developing countries, it has been the threat of Japanese industrial productivity and the success of Japanese industrial products in penetrating European and North American markets for steel, automobiles and electronic products which have generated the most acrimonious protests. Few major changes have been made in the conditions under which most manufactured exports from developing countries are permitted to enter the markets of the industrial economies during the past year or two. In textiles and garments, while quota arrangements and conditions for exporting to the developed market economies have been altered and made more strict, chiefly under the terms of the Multi-Fibre Agreement (MFA), the quantitative effects have been difficult to identify.

120. The leading garment exporters in this region, Hong Kong in particular and the Republic of Korea, have accepted the necessity progressively to abandon low-skill-content garments and relatively labour-intensive textiles to developing countries with lower wages, while moving into more skill- and capital-intensive lines. For the rest, countries with comparatively lower wage levels and more recent entry into textile and garment export production have been able to increase their exports to the industrial countries appreciably even as the recession-induced slackening of demand began to be felt during 1980. Thus, total textile and garment exports from Thailand to the industrialized countries expanded by 19 per cent in nominal value during 1980 (approximately a 7 per cent increase after adjustment for the increase in export prices) within existing quota limits.

121. In contrast with this experience, the Indian garment export industry has shown clear signs of stagnation during the past two years after rapid expansion into export markets in the early 1970s. Although export growth remained rapid until 1978/79, only marginal expansion has been reported for 1979/80. The causes of this stagnation are mixed and include the effects of the recession in the industrialized countries, which provide virtually the entire market. Competition from producers in other developing countries in the region has apparently been important, particularly as some of them are better able to produce polyester-cotton and other blended fabrics; Indian production and exports are predominantly of cotton fabrics and flexibility in shifting to more readily marketable fabrics has been difficult to achieve. The quotas established under the bilateral agreements with importing countries add to these difficulties by stipulating quota levels for specific types of fabric and garment.

122. There are other examples of comparatively small industries producing textiles and garments from which exports have grown quite satisfactorily.[17] Although Malaysian exports of textiles, clothing and footwear continue to face quantitative and tariff restrictions in the major industrial countries, textile exports grew by 18 per cent in value in 1980 (in comparison with 24 per cent in 1979) while garment export values rose by 17 per cent. In constant prices these increases look rather less impressive: about 8 per cent growth in textiles and less than 4 per cent in garments. For large producers and exporters, quotas and other restrictions have become rather more burdensome. Although it is difficult to distinguish the effects of such restrictions from slack demand in the importing countries, the fact that textile and clothing exports from Hong Kong languished in 1980 is unmistakable. During the first eight months of the year these exports grew by bare-

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[17] Reports from the Philippines and Sri Lanka indicate that textile and garment exports did well in 1980.

ly 6 per cent in quantum (on the January-August figures for 1979) while total manufactures exports increased by nearly 16 per cent. For the first six months of 1980 the Republic of Korea's textile exports increased by more than a third but garment exports declined (both in quantum terms) compared with the first six months of 1979.

123. From such evidence, seen in the context of slackening demand for developing country exports of manufactures, restriction of imports into the industrial countries exacerbates an already difficult situation. Despite the reported "good performance" of textile and garment exports, the increase in volume has been extremely modest. The original aims of the MFA were to expand trade, reduce barriers and allow the textile industries in developing countries to grow substantially. Although economic conditions have changed considerably since the 1974 MFA was signed, the figure set in the original agreement was a minimum of 6 per cent growth; whether this rate has generally been attained is a matter which should be ascertainable. Whether a new agreement will retain this rate or stipulate any particular rate is perhaps less important than that the compromise embodied in the agreement should be viable. It is apparent that in its application MFA has generally failed to satisfy the needs of the developing countries. Under present circumstances the prospects for a new agreement more satisfactory to the developing countries do not appear to be bright.

124. Recent policy developments in three south Asian economies concern issues of general interest and importance. The following paragraphs describe them briefly.

125. A new strategy for industrial development announced during 1980 by the Indian Government is designed to diffuse industrial activity throughout the country as a means to increase employment and reduce poverty and economic backwardness. The key element in the strategy is to establish nucleus industrial plants in various regions and to encourage smaller, ancillary activities to develop around them. Incentives already on the statute books — provision of infrastructural facilities, tax holidays, concessional power rates and the like — will be made available. The nucleus factories may be either private or public-sector companies which will be responsible for the co-ordination of the smaller, ancillary units, working as parts suppliers and subassemblers under long-term contracts. Quality control and marketing arrangements will be the responsibility of the nucleus establishments. It is expected that State sector enterprises which have export marketing capability will respond to this opportunity for expansion. It is hoped that private companies will respond as well.

126. Early plans envisage more than 100 such complexes to be organized over a longer period, while the Government intends to organize half that number within a year. The initial complex, for which ground was broken in the Punjab in November, was slated to include factories producing photo-offset printing machinery, textile machinery, electric ceiling fans and bicycles. Financial resources are expected to come initially from the nucleus companies; as the plans involve chiefly light industrial operations, fixed capital costs are not expected to be large.

127. In July 1980 the Indian Government announced its decision to liberalize the definition of small-scale industry, doubling the upper limit for investment in plant and equipment and nearly doubling the corresponding limit for ancillary industries. The significance of this decision is that it permits the entry of firms of appreciably larger size than previously stipulated into branches of industrial activity reserved for small-scale operators. Intended as a measure to facilitate the financing of small-scale operations and to expedite the development of small-scale industry, the decision has been criticized on the grounds of equity.[18] It is feared that a disproportionate share of the benefits of the preferential treatment extended by the Government to small-scale industry will accrue to the appreciably larger units now to be permitted entry into branches reserved for small-scale operators. According to the findings of a study published by the Reserve Bank of India, a marked positive correlation exists between the size of small-scale units and their access to finance from commercial banks and other financial institutions.[19] The skewed distribution of institutional credit among small-scale units is brought out most clearly in the classification of credit according to the size of individual advances. Thus, 88 per cent of the small-scale units receiving credits from banks in amounts of less than Rs 100,000 received in aggregate only 18 per cent of the total institutional credit; the remaining 82 per cent of the total went to 12 per cent of the borrowers in loans, each of which exceeded Rs 100,000, while at the upper end of the distribution 1 per cent of all qualified borrowers, each with a credit of Rs 1 million, received fully 33 per cent of the total amount of credit investigated by the study.

128. In the industrial policy statement in mid-1980, which raised the limits for small-scale operations,

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[18] "Small industries. How large is small?", *Economic and Political Weekly* (Bombay), 2 August 1980.

[19] Reserve Bank of India, *Bulletin*, April 1980.

the Government announced concessions to large industrial houses and companies with foreign equity for greater access to "core" industries which have been reserved mainly for the public sector since 1956. Expansion of capacity in 34 of these industries (including most of those recently opened to selected foreign investors) has been made automatic within specified limits, thus enlarging the group of 15 such industries in which similar expansion has been permitted since 1975. Provision has been made as well for selective legalization of capacity expansion beyond licensed limits. Income-tax concessions have been announced for companies undertaking expansion, modernization and production for export.

129. Another new departure by the Indian Government concerns foreign participation in industrial financing. Previously foreign equity participation was permitted only in priority areas or coupled with technology transfer or production for export. The escalating balance-of-payments deficit caused chiefly by the 1979-1980 increases in petroleum prices is believed to have prompted the authorities to look for new sources of industrial investment. Companies from oil-exporting developing countries will now be permitted to buy up to 40 per cent of the equity in an Indian company in a basic industry without having to provide a transfer of technology. At the same time, it was announced that Indian companies would be allowed to seek foreign-currency loans under certain conditions. Existing regulations governing private foreign investment remain and established priorities for industrial investment are unaltered.

130. This concession is intended to give India access to petro-dollar financing for the development of basic industries such as cement, fertilizers, pulp and paper, petrochemicals, pharmaceuticals and machine tools. Establishment of production capacity in these industries will reduce import requirements. Export-oriented production has been specified in such branches as turbines, industrial prime-movers, electrical machinery and transport equipment. Industrial co-operation with oil-exporting countries may help to promote Indian exports to the investing countries and assistance in obtaining foreign-currency credits may also be forthcoming.

131. In Bangladesh moves have also been made to encourage the private sector to participate more fully in industry, thus relaxing the earlier policy of concentration of industrial activities in the public sector. The Government has begun to assist private companies by providing capital, credit and technical assistance. As an incentive to increase the production of manufactured exports, the decision has been taken to establish export processing zones. The Government has also let it be known that Bangladesh will actively seek private foreign investment in industrial activities.[20]

132. Liberalization of the Sri Lankan economy, initiated following the change in Government in 1977, included the provision of investment incentives to foreign investors; a free-trade processing zone has been established at Colombo and efforts are being made to promote non-traditional export as earnings from tea, coconut and rubber have diminished critically over the last several years. Imports have been liberalized to assist private industry in obtaining inputs for manufacturing and assembly operations. Textile and garment production has commenced and exports of these products have increased. Dependence on imported inputs and the necessity to import oil (some of which is refined for re-export) for manufacturing, power generation and transport have brought a large and sharp rise in the balance-of-payments deficit. Prompted by the increased requirements for foreign exchange, the Government is reported to have launched a renewed campaign to entice private foreign investors, laying special emphasis on the establishment of export capacity.

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[20] Brief notice of these policy decision appears in the introduction to the annual *Bangladesh Economic Survey, 1979–80* (Ministry of Finance, Dacca, 2 June 1980). See also the report in *The Asian Wall Street Journal* (Hong Kong, 6 January 1981), "Mixed economy to attract investors to Bangladesh" (Ian Gill).

IV. EXTERNAL TRADE AND PAYMENTS

133. Instability in international commodity and financial markets during 1979 and 1980 influenced perceptibly the patterns of trade and payments in the developing ESCAP region. In these years the second oil price shock added substantially to the cost of crude oil, which was at least 90 per cent higher in real terms in 1980 than in 1978. At the same time, trade was affected by the slowdown in economic activity in the industrial economies as well as by persistently increasing world inflation.

A. MERCHANDISE EXPORTS

134. Table 16 indicates that the rapid expansion of world exports in 1979 (by 25 per cent in current values) and over 20 per cent in the first half of 1980 (at an approximate annual rate) included a leap in the OPEC share from a small negative figure in 1978 to a quarter of the annual increment. Nevertheless, several non-oil developing economies in the ESCAP region were able to keep pace with this expansion. As a group, the non-oil developing countries of south-east Asia (not including Indonesia) recorded impressive increases in their merchandise export earnings, with a 41 per cent increase in 1979 and 28 per cent for the first half of 1980 (annual rate). The south Asian economies, however, continued to experience comparatively lower growth rates in their merchandise exports.

135. A breakdown by country of total export values from ESCAP member countries and areas given in table 17 confirms the general observations noted above. The oil-exporting countries, with the exception of Iran, experienced very rapid growth in export values over 1979/80 in consequence of the increase by 2.5 times in the price of crude. During the first half of 1980 most of the non-oil developing countries in south and south-east Asia maintained high rates of export growth although few were able to match the exceptionally high rates of export expansion achieved in 1979. India and the Republic of Korea, with decreased rates of growth, were among the exceptions. Of the island economies in the South Pacific, Fiji benefited greatly from the sugar price boom of 1979/80 although the seasonality of sugar production ensures that this growth does not appear in the first half year. Substantial increases in gold and copper prices helped to raise the export earnings of Papua New Guinea in 1979 but the full year's export values fell short in 1980.

Table 16. World and ESCAP. Exports (f.o.b.) 1976-1980
($US billions)

	1976	*1977*	*1978*	*1979*	*1979*	*1979*	*1980p*
					1st half	*2nd half*	*1st half*
Market economies:							
World total	897.3	1 018.6	1 176.5	1 476.8	681.5	795.3	897.9
A. Developed	634.2	730.4	874.4	1 075.6	504.7	570.9	630.5
B. Developing	254.1	288.2	302.1	401.2	176.8	224.4	267.4
1. OPEC	137.6	151.3	145.4	208.6	87.3	121.3	147.1
2. Non-oil[a]	116.5	136.9	156.7	192.6	89.5	103.1	120.3
C. ESCAP	159.1	184.7	211.7	242.9	108.5	134.4	140.8
1. Developed[b]	82.9	96.8	115.4	126.2	59.1	67.1	72.6
2. Developing[c]	76.2	87.9	96.3	116.6	49.4	67.2	68.2
(a) Oil exporters	33.3	36.7	35.6	38.1	13.8	24.3	22.3
(b) Non-oil exporters	42.9	51.2	60.6	78.5	35.6	42.9	45.9
(i) South Asia	8.2	9.4	10.1	11.4	5.7	5.8	5.8
(ii) South-east Asia	17.4	20.9	25.0	35.2	15.9	19.3	22.4
(iii) East Asia	16.5	19.9	24.5	30.6	13.5	17.1	17.2
(iv) Pacific	0.7	0.9	1.0	1.2	0.5	0.7	0.5
(c) ASEAN[d]	26.0	31.8	36.7	50.8	22.4	28.4	33.0

Sources: United Nations, *Monthly Bulletin of Statistics*, December 1980, supplemented by International Monetary Fund, *International Financial Statistics*, November 1980, and national sources.

Notes: [a] Non-OPEC.

[b] Australia, Japan and New Zealand.

[c] Oil exporters and non-oil exporters, listed in table 17.

[d] Indonesia, Malaysia, the Philippines, Singapore and Thailand.

p Preliminary.

Table 17. Developing ESCAP. Exports (f.o.b.), selected economies. 1976-1980

($US millions)

	1976	*1977*	*1978*	*1979*	*1979* *1st half*	*1979* *2nd half*	*1980p* *1st half*
Developing ESCAP	76 196	87 889	96 278	116 573	49 377	67 196	68 177
1. Oil exporters	33 330	36 725	35 653	38 099	13 816	24 283	22 261
Brunei	1 284	1 613	1 813	2 649	1 078	1 571	2 135
Indonesia	8 547	10 853	11 643	15 590	6 539	9 051	10 631
Iran	23 499	24 259	22 197	19 860	6 199	13 661	9 495
2. Non-oil exporters	42 866	51 164	60 625	78 474	35 561	42 913	45 916
(a) South Asia	8 278	9 384	10 138	11 430	5 668	5 762	5 808
Afghanistan	299	314	322	429	148	281	276
Bangladesh	432	451	552	665	325	340	378
Burma	193	226	243	363	161	202	238
India	5 526	6 378	6 614	6 827	3 504	3 323	2 983
Nepal	98	81	91	109	57	52	38
Pakistan	1 163	1 171	1 470	2 056	1 039	1 017	1 388
Sri Lanka	567	763	846	981	434	547	507
(b) South-east Asia	17 420	20 952	25 025	35 216	15 908	19 308	22 398
Malaysia[a]	5 281	6 078	7 381	11 074	4 994	6 080	6 416
Philippines	2 574	3 151	3 425	4 601	2 090	2 511	2 769
Singapore	6 585	8 241	10 134	14 233	6 236	7 997	9 331
Thailand	2 980	3 482	4 085	5 308	2 588	2 720	3 882
(c) East Asia	16 459	19 918	24 472	30 598	13 488	17 110	17 168
Hong Kong	8 526	9 626	11 499	15 156	6 544	8 612	8 991
Macao	218	245	262	387	172	215	200
Republic of Korea	7 715	10 047	12 711	15 055	6 772	8 283	7 977
(d) Pacific	709	910	990	1 230	497	733	542
Fiji	127	172	199	249	77	172	111
Papua New Guinea	575	723	780	963	414	549	421
Samoa	7	15	11	18	6	12	10

Source: Same as table 16.

Note: [a] Adjusted to exclude intra-trade.

136. Preliminary estimates of the total value and composition of merchandise exports from developing ESCAP countries (see table 18) reveal several noteworthy developments. The first is the reduction in oil shipments (from Iran) and total export values for oil. This factor is the main reason for the increasing share of manufactures and primary products exports in total export values in 1979 and, on the basis of these preliminary estimates, in 1980 as well. Secondly, in current prices, manufactured exports and primary products from the developing ESCAP region rose at an accelerated pace in 1979 but both rates of expansion slackened markedly in 1980. While the export growth during the second half of 1980 is subject to revision, partial reports at year's end suggest that the direction of change will likely be confirmed when comprehensive data are available. Thirdly, the lower panel of table 18 presents estimates of quantum changes in these three classes of exports. Derived from export price indexes which are crude at best, the rates of change which appear in the table should be sufficiently accurate to permit a valid assessment of broad orders of magnitude and directions of change.[21] Shifts in patterns of quantum change in oil exports apart, the behaviour of the volume of primary products exports reflects a considerable acceleration in 1979 (which revised data generally confirm) but virtual stagnation during 1980. In contrast, the estimated volume of manufactures exports continued to increase in both years but at diminishing rates.

137. Not surprisingly, export prices of primary products important in the trade of developing ESCAP countries generally rose during 1979 and

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[21] The assumptions underlying the estimates of changes in the volume of oil exports are presented in the notes to table 18. It should be noted that the quantum estimate for each class of export has been made independently of the others.

Table 18. Developing ESCAP. Composition of domestic exports, 1977-1980, annual changes in value and volume

	1977	1978	1979	1980	
				First half	*Full year (estimate)*[a]
Total exports (gross) ($US million)[b]	87 890	96 280	116 570	68 200	126 205
Domestic exports ($US million)[c]	82 310	89 200	106 800	61 650	114 130
Petroleum[d]	32 960	31 650	32 480	19 360	30 270
Primary products[e]	22 710	25 180	33 940	19 685	37 830
Manufactures[f]	26 640	32 370	40 380	22 605	46 030
Shares of domestic exports (percentages)					
Petroleum	40.0	35.5	30.4	31.4	26.5
Primary products	27.6	28.2	31.8	31.9	33.1
Manufactures	32.4	36.3	37.8	26.7	40.3
Change from preceding year (percentages)					
Value (current prices)					
Domestic exports (total)		8.4	19.7		6.9
Petroleum		—4.0	2.6		—6.8
Primary products		10.9	34.8		11.5
Manufactures		21.5	24.7		14.0
Volume[g]					
Domestic exports (total)		4.6	—3.8		—9.6
Petroleum		—4.0	—29.4		—44.8
Primary products		10.0	15.0		—0.3
Manufactures		10.8	7.8		6.6
(Non-oil exports)		(10.4)	(11.1)		(3.3)

Sources: United Nations, *Monthly Bulletin of Statistics,* December 1980; International Monetary Fund, *International Financial Statistics,* November 1980; and national sources.

Notes: [a] Based on incomplete information for the second half year. Estimated petroleum export values assume a rate of exports from Iran during the third quarter of 1980 equivalent to the average rate for the first two quarters; for the fourth quarter Iranian exports are assumed nil. The sensitivity of major values to variations in this assumption has been tested by substituting an assumed rate for Iranian exports during the fourth quarter equivalent to half the average rate for the first three quarters, *ceteris paribus.* This alternative yields the following values (only changed values indicated).

Total gross exports	$US 128 555 million	
Domestic exports	116 480 million	
Petroleum exports	32 620 million	
Domestic export shares (percentages)		
Petroleum	28.0	
Primary products	32.5	
Manufactures	39.5	
Change from preceding year (percentages)		
Value (current prices		Volume
Domestic exports (total)	9.1	—8.5
Petroleum	0.4	—40.5

[b] From all major trading economies; excluding the centrally planned economies.

[c] Excludes re-exports from Hong Kong and Singapore and elsewhere as data permit.

[d] Petroleum, crude and refined, from major producers: Iran, Indonesia, Brunei and Malaysia; excludes refined products exports from non-producers of crude.

[e] Excluding crude petroleum and refined products indicated in note [d].

[f] SITC sections 5–8 from eight major manufactures exporters, plus estimated values for other exporting countries; excludes refined petroleum products, classified under SITC 3.

[g] Based on volume indexes obtained by deflating total values for each product group by export price (unit value) indexes, derived from major export economies in the developing ESCAP region, using 1975 weights.

Table 19. Developing ESCAP region. Changes in export prices of primary commodities,[a] 1977-1980$_p$

(Annual and quarterly percentage changes)

	1977	*1978*	*1979*	*1980p*	*1980*			
					I	*II*	*III*p	*IV*p
Primary commodities (excluding petroleum)	23.6	0.8	17.1	11.8	—6.1	—1.5	1.6	—0.2
Food-stuffs	36.6	—17.5	4.5	34.7	6.7	11.8	2.5	1.0
Wheat	—25.6	20.3	24.7	7.3	—3.8	—4.9	5.2	9.8
Rice	8.3	25.6	—6.1	31.5	9.6	6.1	2.5	2.4
Maize[b]	—7.0	—	28.8	25.2	4.7	8.0	14.0	5.1
Coffee	75.0	—34.9	6.1	—	—8.0	3.9	—9.8	—10.1
Cocoa	136.0	—31.8	—6.2	—18.9	2.2	—16.7	—9.7	4.0
Tea	78.6	—20.5	—0.6	5.1	—4.0	0.6	—1.2	—
Pepper	36.6	—9.4	—8.0	5.2	0.8	—	—2.5	6.8
Sugar	—29.8	—2.5	23.1	183.3	43.9	41.0	14.9	5.8
Agricultural non-food	14.8	12.5	22.9	0.5	—14.2	—8.9	1.9	0.3
Copra	46.3	16.5	42.9	—32.3	—8.0	24.0	4.8	—9.8
Coconut oil	39.0	21.6	40.8	—34.0	—2.5	—24.2	—4.0	—4.9
Palm oil	28.7	14.0	13.0	—14.1	6.9	—11.7	—8.8	—3.2
Lumber	9.3	10.1	19.0	4.7	—0.6	—8.0	11.1	5.0
Logs	26.2	13.4	32.8	30.8	6.5	8.9	5.3	2.4
Cotton	—3.8	—1.6	6.4	16.5	11.0	—1.3	4.0	5.2
Jute	7.2	23.6	0.9	—7.2	2.9	—0.9	—	—12.3
Natural rubber[c]	1.8	13.4	21.5	11.6	18.0	—11.2	—1.3	0.7
Tobacco	8.8	6.3	10.2	5.4	—	0.7	1.5	0.7
Non-ferrous metals	26.2	12.3	22.8	13.1	8.2	—1.0	—1.8	—5.4
Copper	—7.0	4.7	45.0	12.4	23.3	—21.7	4.2	0.6
Nickel	5.5	—1.7	30.1	25.8	8.5	4.5	—	—
Tin	42.0	18.2	18.6	9.0	6.3	—	0.4	—8.2
Crude petroleum	10.4	—	45.3	70.6	23.2	7.1	4.6	4.7

Sources: United Nations, *Monthly Bulletin of Statistics*, December 1980; International Monetary Fund, *International Financial Statistics*, November 1980; and national sources.

Notes: — Indicates value less than 0.1.

[a] Derived from index numbers, 1975 = 100; chiefly from table 59 of the first source. Third and fourth quarter figures from current sources. Group totals are weighted averages based upon 1975 export values from developing ESCAP economies.

[b] Bangkok export price, yellow maize.

[c] Malaysian Rubber Exchange, ribbed smoked sheet no. 1 (RSS–1).

p Provisional.

1980 in the milieu of international inflation (see table 10). The continuing rise in the prices of sugar, non-ferrous metals, maize, logs and, to a lesser extent, rubber was particularly notable. The present shortage in world sugar supplies and stocks and hence higher sugar prices are expected to persist at least until early 1982. Futures prices for non-ferrous metals are rather uncertain as world demand for these commodities is subject to strategic stockpiling needs. Coffee, cocoa and tea have suffered from a price downswing in recent years. The prospects for a recovery in their prices, especially in the case of coffee and cocoa, are apparently not promising. Discussions for a new international agreement on cocoa broke down late in 1980, and there appears to be no formal mechanism to underpin falling prices. World coffee production has recovered from the serious set-back of the mid-1970s. The amount of exportable coffee is estimated to be about 62.4 million bags during 1980/81, compared with an expected total demand of around 56.9 million bags. Much would seem to depend on the effectiveness of the export quota system, based on certificates of country of origin, introduced among coffee-producing countries to stabilize and maintain world coffee prices at around $US 1.35 per pound, approximately the price prevailing in mid-1980.

138. Prices of major foodgrains continued to rise during 1980 and the price of rice increased greatly. With the prospect of a world shortage of foodgrains and low level of foodgrain stocks at the beginning

of the 1981/82 crop year, it is expected that prices of wheat and coarse grains will continue to rise during 1981/82. For food-deficit countries in the region, this prospect can only be viewed with foreboding. Following several years of rapidly rising prices, the very considerable fall in prices of vegetable oils suggests a marked shift in market conditions. An uncommonly large stocking of these oils, including palm oil stocks in producer countries such as Malaysia, is reflected in stagnant or falling futures prices. Whereas producers of annuals, such as groundnuts and soybeans in this region, will be able to adapt to falling prices by reducing planted acreages, recourse to cutbacks in production is not economically feasible for tree crops such as palm oil and coconut, which are of importance to several ESCAP countries.

139. Detailed information concerning the behaviour of manufactured exports from individual ESCAP member countries is generally lacking and the available data indicate but few persistent trends. The expansion of manufactured exports virtually determines the rate of manufacturing production growth in Hong Kong and Singapore and is exceptionally important for the Republic of Korea. While the share of manufactured exports in total export earnings has been growing over time, the growth rates of manufactured exports, although rather uneven in several ESCAP member countries, has apparently been very rapid. Apart from the manufactures exporters just mentioned, Malaysia, the Philippines and Thailand have recorded exceptionally rapid annual rates of manufactures export growth during the 1970s. As a result, the export manufacturing sector has gained considerably in relative economic importance in the mainly agricultural economies of these countries.

140. In varying degree this growth has valuable linkages with the agricultural base. In contrast, however, manufacturing production in enclave export processing zones has frequently failed to provide the strong economic stimulus once anticipated. Even less satisfactory in this regard is the nearly total lack of demand and supply links with the domestic economy in off-shore assembly operations, pre-eminently of electronics parts, subassemblies and appliances.

141. The volatile and uncertain political and economic situation in the world economy at the present time emphasizes the tentative nature of any discussion of future export prospects of ESCAP member countries. Nevertheless, there is general agreement that the economic slowdown being experienced in most industrial countries will affect adversely the growth of merchandise exports from, and hence domestic economic activities of, ESCAP member countries. Another barrier against merchandise exports from developing ESCAP economies relates to the persistence of protectionist measures in the industrial countries with which developing ESCAP countries trade. Mention has earlier been made of the restrictions on the export of textiles and clothing from several member countries (see chapter III, section B.3 above). Although the existing situation is relatively stable, uncertainty about future conditions springs from the termination of the Multi-Fibre Agreement at the end of 1981, given the expected increase in the incidence of unemployment in the OECD countries.

142. However, there have been some promising developments. For example, at the end of 1979 ministers from the ASEAN countries determined to increase by about 75 per cent the number of items to be included in the ASEAN Preferential Trading Arrangement. By contrast, the implementation of the Tokyo Round multilateral trade negotiation agreements has generally been disappointing. For textile and steel products, for example, the first tariff cuts will not apply until the beginning of 1982. In general, the downward adjustments in protective tariffs will be phased in and completed only by 1987.

B. MERCHANDISE IMPORTS AND THE BALANCE OF TRADE

143. The most general pattern observable in the presentation of commodity imports in table 20 is the general rise in import values, which is primarily the result of world inflation and the increase in oil prices. The expansion of merchandise imports (in current value terms) of the developing ESCAP region averaged about 19 per cent per year during 1976-1980, but such an average masks quite varied performance among country groups. The major oil-exporting countries taken together show a pattern of decline up to 1979 but an estimated increase in 1980; in the event, the decline is entirely attributable to Iran. The imports of the non-oil developing ESCAP economies expanded at moderately increasing rates until 1980, when the rate of growth appears to have slackened, judging from the figures for the first half year. On the whole, the pace of import growth has been greater than that of merchandise exports.

144. The more detailed information relating to the flows of commodity imports into individual ESCAP member countries reveals considerable differences among them (see table 21). Despite these differences, some generalization by subregional groups may be indicative. Thus, during the minor upswing

Table 20. World and ESCAP. Imports (c.i.f.), 1976-1980

($US billions)

	1976	*1977*	*1978*	*1979*	*1979*	*1979*	*1980p*
					1st half	*2nd half*	*1st half*
Market economies:							
World total	912.0	1 046.4	1 213.6	1 518.6	697.0	821.6	913.8
A. Developed	704.0	796.2	921.7	1 182.3	543.4	638.9	718.2
B. Developing	208.0	250.2	291.9	336.3	153.6	182.7	195.6
1. OPEC	63.9	85.2	99.2	99.5	46.1	53.4	56.2
2. Non-oil[a]	144.1	165.0	192.7	236.8	107.5	129.3	139.4
C. ESCAP	146.8	165.1	190.1	244.0	109.2	134.7	148.8
1. Developed[b]	79.1	86.2	96.1	131.6	59.3	72.3	81.7
2. Developing[c]	67.7	78.9	94.0	112.4	49.9	62.4	67.0
(a) Oil exporters	18.8	20.6	20.5	17.4	6.2	11.1	9.4
(b) Non-oil exporters	48.9	58.3	73.5	95.0	43.7	51.3	57.6
(i) South Asia	9.9	12.0	14.7	17.0	7.8	9.1	11.3
(ii) South-east Asia	20.4	23.9	29.0	38.8	17.7	21.0	24.0
(iii) East Asia	17.8	21.5	28.7	37.8	17.5	20.3	21.6
(iv) Pacific	0.7	0.9	1.1	1.4	0.6	0.8	0.8
(c) ASEAN[d]	26.1	30.1	35.7	46.0	20.9	25.1	27.8

Sources: United Nations, *Monthly Bulletin of Statistics,* December 1980, supplemented by International Monetary Fund, *International Financial Statistics,* November 1980, and national sources.

Notes: [a] Non-OPEC.

[b] Australia, Japan and New Zealand.

[c] Oil exporters and non-oil exporters, listed in table 21.

[d] Indonesia, Malaysia, the Philippines, Singapore and Thailand.

p Preliminary.

in exports during 1979, which was not widely shared by south Asian economies, their imports also expanded less rapidly than those of east and south-east Asian countries. In 1980, however, if the half-yearly data are meaningful, the pattern has apparently been reversed.

145. In individual instances, such as those of Bangladesh and Sri Lanka, the increasing rate of import expansion doubtless reflects quickened development efforts. In Indonesia during 1979 the low rate of import growth reflects reduced food imports as a result of a very good rice crop in 1978/79 as well as the effects of the devaluation in November 1978, which reduced demand for consumer goods imports and for imported inputs for manufacturing. In particular, output from industries relying heavily on imported inputs, such as motorcycles, auto assembly and radio and TV assembly, contracted sharply in 1979/80.

146. The devaluation of the won in January 1980, and its gradual depreciation thereafter, plus tightened credit policies as part of the anti-inflation programme in the Republic of Korea also appear to have slowed the demand for merchandise imports. Judging from preliminary data, the rate of import growth fell from 36 per cent in 1979 to 13 per cent for the first half of 1980 (on the corresponding six months in 1979).

147. Doubtless the most common and most compelling reason for rapid increases in the import bill during 1979 and 1980 is found in the petroleum price increase. The data in table 22 indicate with few exceptions that mineral fuels have become an increasingly important component of total import spending for non-oil exporting countries. The oil price rise of 1979/80 has raised markedly the share of petroleum products in the total import bill of the majority of the developing ESCAP countries. Given the relatively large share of fuel imports, the share of others must be proportionately reduced. It is apparent that the relative change in the remaining categories must give some indication of implicit priorities in accommodating the higher cost of this virtually non-compressible import. It will be noted that some countries, of which Pakistan is an example and the urban economies, Hong Kong and Singa-

Table 21. Developing ESCAP. Imports (c.i.f.), selected economies, 1976-1980

($US millions)

	1976	*1977*	*1978*	*1979*	*1979*	*1979*	*1980*
					1st half	*2nd half*	*1st half*
Developing ESCAP	67 717	78 847	94 050	112 336	49 947	62 390	66 988
1. Oil exporters	18 820	20 576	20 515	17 357	6 232	11 125	9 361
Brunei	253	276	276	394	165	229	231
Indonesia	5 673	6 230	6 690	7 225	3 215	4 010	3 810
Iran	12 894	14 070	13 549	9 738	2 852	6 886	5 320
2. Non-oil exporters	48 897	58 271	73 535	94 979	43 715	51 265	57 627
(a) South Asia	9 917	11 956	14 732	17 025	7 847	9 179	11 283
Afghanistan	335	498	682	328	180	148	150
Bangladesh	788	1 183	1 350	1 777	677	1 100	1 006
Burma	194	309	309	319	132	187	216
India	5 710	6 648	7 955	8 843	4 024	4 819	6 039
Nepal	163	168	222	254	126	129	162
Pakistan	2 174	2 447	3 275	4 056	2 024	2 032	2 712
Sri Lanka	553	703	939	1 448	684	764	998
(b) South-east Asia	20 420	23 916	29 048	38 775	17 727	21 048	23 961
Malaysia[a]	3 825	4 536	5 911	7 842	3 437	4 405	4 495
Philippines	3 953	4 270	4 732	6 142	3 125	3 017	3 826
Singapore	9 070	10 471	13 049	17 635	7 803	9 832	11 238
Thailand	3 572	4 639	5 356	7 156	3 362	3 794	4 402
(c) East Asia	17 838	21 485	28 671	37 826	17 538	20 288	21 573
Hong Kong	8 882	10 457	13 452	17 137	7 734	9 403	10 531
Macao	182	217	247	350	156	194	179
Republic of Korea	8 774	10 811	14 972	20 339	9 648	10 691	10 863
(d) Pacific	722	914	1 084	1 353	603	750	810
Fiji	263	306	355	470	209	261	261
Papua New Guinea	426	567	676	810	363	447	521
Samoa	30	41	53	73	31	42	28

Source: Same as table 20.

Note: [a] Adjusted to exclude intra-trade.

Table 22. Developing ESCAP economies. Import composition by commodity section, 1976-1980

(Percentage)

Country or area		*Food*	*Raw materials*	*Mineral fuels*	*Chemicals*	*Manufactures (by materials)*	*Machinery, transport equipment and other manufactures*
	(SITC)[a]	*(0+1)*	*(2+4)*	*(3)*	*(5)*	*(6)*	*(7+8)*
South Asia							
Bangladesh[b] . . .	1975/76	30	18	13	12	12	15
	1976/77	14	9	24	7	25	21
	1977/78	26	16	15	7	19	18
	1978/79	11	19	14	14	19	23
	1979/80[c]	34	8	18	7	15	17
India	1975/76[d]	24	16	21	11	11	17
	1976/77[d]	19	9	28	9	13	22
	1977	4	12	29	12	18	23
	1978	4	17	25	12	22	20
	1979[e]	4	14	27	13	23	18
Nepal	1976	17	5	11	10	28	29
	1977	13	2	13	11	33	26
	1978	14	3	11	10	34	28
Pakistan[b]	1975/76	15	12	19	9	16	29
	1976/77	9	13	18	12	17	31
	1977/78	12	13	18	12	16	29
	1978/79	15	15	14	15	16	25
	1979/80	8	11	23	12	16	30
Sri Lanka	1976	36	3	25	7	13	15
	1977	39	3	24	6	13	13
South-east Asia							
Indonesia	1976	14	4	8	10	21	43
	1977	16	4	12	10	20	39
	1978	16	5	9	11	19	40
Malaysia	1976	16	6	13	9	17	38
	1977	16	6	13	10	16	39
	1978	16	5	11	9	17	41
	1979	13	5	12	10	17	42
	1980[f]	12	5	13	11	17	41
Philippines	1976	10	4	24	10	13	32
	1977	9	5	24	11	14	20
	1978	8	5	21	11	15	30
	1979	7	5	22	11	15	29
	1980[g]	8	4	28	10	13	26
Singapore	1976	9	10	27	5	15	33
	1977	9	11	26	5	14	33
	1978	8	10	24	5	16	36
	1979	7	10	25	6	15	36
	1980[h]	6	10	29	5	14	35
Thailand	1976	4	7	23	14	16	33
	1977	4	8	22	14	16	34
	1978	4	7	21	14	17	35
	1979	4	8	22	15	18	32
	1980[h]	4	6	32	13	15	28
East Asia and Pacific							
Fiji	1976	20	2	16	6	18	35
	1977	21	2	19	7	18	29
	1978	22	1	16	7	19	30
	1979	18	1	18	7	30	22
Hong Kong . . .	1976	17	8	6	8	31	29
	1977	16	7	6	7	30	33
	1978	15	6	5	7	33	34
	1979	13	5	6	8	31	36
	1980[i]	11	6	7	8	30	37
Papua New Guinea .	1975/76	23	1	14	6	14	40
Republic of Korea . .	1976	7	18	20	10	13	31
	1977	7	19	20	9	14	31
	1978	6	17	16	9	15	37
	1979	7	17	19	10	13	34
	1980[h]	8	17	29	9	11	26

Sources: *Statistical Yearbook for Asia and the Pacific, 1978* (United Nations publication, Sales No. E/F.79.II,F.4), and national sources.

Notes:
[a] Totals include SITC 9, miscellaneous transactions.
[b] Years ending in June.
[c] Three months.
[d] Years beginning in April.
[e] January–April.
[f] Preliminary.
[g] January–October.
[h] January–June.
[i] January–July.

pore, are others, have been able to reduce the share of food imports as the share of fuels expanded. In other cases, of which Fiji is an example, the share of food imports has been reduced but a relatively greater reduction appears in the share of machinery, transport equipment and other manufactures.

148. Manufactured and semi-fabricated commodities, including chemical products, have tended to maintain or marginally increase their share of total import outlays. As imports required for development, the most important of these industrial products are machinery and transport equipment. The possibility of having to restrict such essential imports, to accommodate balance-of-payments constraints induced by the oil price, has serious implications. The possible effects on investment and on manufacturing activity, including the threat of increased unemployment, are demonstrably undesirable. Yet in the short term the options are sharply limited. Greater efforts and stronger policy measures are required to limit and reduce energy imports, as well as imports of consumer goods of the luxury variety.

149. The high and rising rates of commodity imports plus faster expansion of import spending relative to export earnings, noted earlier, mean a large and possibly growing trade gap. In fact, most non-oil-exporting countries in the ESCAP region incurred a substantial import surplus in 1979. This averaged, for example, 33 per cent of total export proceeds for south Asian countries, and about 19 per cent for south-east Asian (excluding Indonesia and Malaysia) and east Asian economies.

150. A more serious development is that available data for the first half of 1980 show an apparently widening (negative) trade gap. This is particularly evident in the trading patterns of several economies within the region — including India, Nepal, Pakistan, Sri Lanka, the Philippines, Fiji and Papua New Guinea. While the increasing excess of imports over exports also appears in the trade balance of Hong Kong and Singapore, their service activities render the comparison far less important than the current account balance. The main exception was Thailand, where favourable export prices and higher demand had reduced the import surplus for 1979 below the expected level. A similar pattern prevailed in 1980 as well; although the nominal figure for the excess of imports increased over that of 1979, better-than-anticipated performance meant a relatively smaller gap.

151. The indexes of relative export and import prices for developing economies in the region (see table 23) indicate generally that export prices were rising slightly faster than the prices paid for merchandise imports in 1979 and, where data are available, during the first half of 1980. Although this represents a modest improvement in the barter terms of trade, such a gain must be interpreted with caution. The base year for the index series, 1975, was the nadir of the world-wide recession; consequently, commodity prices were by and large below their long-term trend levels. Thus, much of the improvement in the barter terms of trade in 1979/80 must be regarded largely as a recovery to more normal levels.

152. The income terms of trade indicate that several developing countries within the ESCAP region have recorded considerable improvements in the purchasing power of their export proceeds since the mid-1970s. Such gains were particularly evident for economies which displayed vigorous export growth performance — including Hong Kong, the Republic of Korea and the ASEAN nations.[22]

153. Marginal devaluations of the exchange rates of ESCAP member countries constituted the common pattern in 1979 and 1980. Notable exceptions were the devaluation of the Samoan tala by 20 per cent in early 1979 and of the Republic of Korea won by 16.5 per cent in January 1980, as part of an over-all stabilization package. Thereafter, the value of the two was permitted to fluctuate under conditions of a controlled float; by September further depreciation of about 7 per cent had taken place. Under quite different circumstances, an exchange-rate policy involving a series of revaluations of the kina in Papua New Guinea over the period 1976-1979 has been pursued quite vigorously as the principal means of insulating the extremely open domestic economy against imported price inflation. These revaluations are considered to have helped to moderate the pace of domestic inflation in Papua New Guinea during this period. At the same time, however, there have been adverse effects especially on export producers of coffee and cocoa, for which export prices have fallen significantly since 1978, and coconut in 1980. The effect of lower import prices clearly works against import substitution in the manufacturing sector as well.

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[22] It may be noted briefly that the terms of trade are also influenced by changes in exchange rates. With few exceptions, however, changes in the exchange values of national currencies relative to the SDR unit were relatively minor during 1979 and the first three quarters of 1980.

Table 23. Developing ESCAP economies. Export and import prices and terms of trade, 1976-1980

(Indexes: 1975 = 100)

Country or area/indexes	*1976*	*1977*	*1978*	*1979*	*1980*	
					(Quarterly) *QI*	*QII*
Non-oil exporters						
South Asia						
Bangladesh[a]					(Full year)	
Export prices	87	101	120	155	183	
Import prices	85	83	84	99	129	
Barter terms of trade	102	122	143	157	142	
Income terms of trade	195	236	255	...		
Burma[b]						
Export prices	104	113	122	113		
Import prices	116	120	128	112		
Barter terms of trade	90	94	95	80		
Income terms of trade	97	110	94	...		
India						
Export prices	104	118	119	127[c]		
Import prices	106	97	92	106		
Barter terms of trade	98	122	129	120		
Income terms of trade	116	130	119	142		
Pakistan[a]						
Export prices	109	131	131	155	188	173
Import prices	96	99	105	118	137	133
Barter terms of trade	114	132	125	131	137	130
Income terms of trade	125	140	145	138	155	167
Sri Lanka						
Export prices	120	192	354	376		
Import prices	88	109	204	310		
Barter terms of trade	136	176	174	121		
Income terms of trade	131	153	161	114		
South-east Asia						
Malaysia (Peninsular)						
Export prices	120	141	151	175	194	
Import prices	102	104	107	115	129	
Barter terms of trade	119	135	141	152	150	
Income terms of trade	135	150	182	236	261	
Philippines					(Full year)	
Export prices	88	89	100	123	134	
Import prices	99	110	112	132	165	
Barter terms of trade	89	81	89	93	81	
Income terms of trade	114	125	134	151	148	

Table 23 (*continued*)

Country or area/indexes	*1976*	*1977*	*1978*	*1979*	*1980*	
					(Quarterly) *QI*	*QII*
Singapore						
Export prices	106	115	119	128	142	146
Import prices	105	113	117	126	141	141
Barter terms of trade . .	101	102	102	102	101	104
Income terms of trade . .	120	139	157	187	214	223
Thailand						
Export prices	97	99	107	130	145	153
Import prices	105	113	122	145	170	177
Barter terms of trade . .	92	88	88	90	85	86
Income terms of trade . .	128	139	151	166	206	159
East Asia						
Hong Kong						
Export prices[d]	110	112	118	139	147	151
Import prices	104	109	115	136	144	147
Barter terms of trade . .	106	103	103	102	102	103
Income terms of trade . .	137	140	154	176	166	208
Republic of Korea						
Export prices	112	122	135	162	168	170
Import prices	98	100	105	129	157	159
Barter terms of trade . .	114	122	128	126	107	107
Income terms of trade . .	155	198	238	230	189	209
Pacific						
Fiji						
Export prices	87	94	88	100		
Import prices	104	104	110	133		
Barter terms of trade . .	84	90	80	75		
Income terms of trade . .	83	108	82	...		
Oil exporters						
Indonesia						
Export prices	107	121	133	237	314	396
Import prices	108	113	122	173	191	198
Barter terms of trade . .	99	107	109	137	164	200
Income terms of trade . .	113	139	150	184		
Iran						
Export prices	106	117	117	177	293	323
Import prices	106	119	123	...		
Barter terms of trade . .	100	98	95	...		
Income terms of trade . .	109	100	90	...		

Sources: United Nations, *Monthly Bulletin of Statistics*, December 1980, table 53, and national sources.

Key: Export and import prices: unit-value indexes.
Barter terms of trade: ratio of export to import prices.
Income terms of trade: barter terms of trade times export quantum index.

Notes: [a] Year ends in June. 1974/75=100.
[b] Fiscal year begins in April.
[c] Half year.
[d] Domestic exports.

C. BALANCE OF PAYMENTS AND EXTERNAL FINANCIAL RESOURCES

154. The current account position of developing ESCAP countries is set out in table 24. The year 1979 witnessed generally larger current accounts deficits than those recorded recently. These resource gaps were mainly covered by official transfers and private capital flows. The latter appeared to be concentrated mostly in east and south-east Asia.

155. There exists very little up-to-date information on private short-term capital flows. The available data on this item in table 24 must be interpreted with some reservations as they also include errors and omissions. With the exception of Malaysia, it appears that short-term capital flows served to bolster the over-all balance of payments and, in several instances, to raise international reserves.

156. Data compiled by the International Monetary Fund indicate that there has been a marked slowdown in the rate of reserve accumulation over the year 1979/80[23] International reserves of non-oil developing ESCAP economies increased on average by 35 per cent in 1976 and 1977. The rate of reserve expansion declined to 12 per cent in 1978, to 10 per cent in 1979 and to only 3.5 per cent between June 1979 and June 1980. It is true that these over-all rates of change tend to conceal significant subregional variations. However, reserve accumulations by individual ESCAP member countries mostly conform to the trend noted. In several economies — Afghanistan, Bangladesh, India, Papua New Guinea, the Republic of Korea, Sri Lanka and Thailand — there was an absolute fall in international assets as of June 1980, compared with the level prevailing a year earlier.

157. The continuous escalation in the cost of oil imports has been a dominant factor affecting the balance-of-payments position of the majority of ESCAP developing countries. For instance, recent estimates based on 1980 oil prices indicate that in the low-income country group the value of oil imports into India and Pakistan have more than doubled between 1978 and 1980. As a percentage of total imports, the value of oil imports between 1978 and 1980 increased in the case of India from 28 per cent to 41 per cent and in Pakistan from 10 to 18 per cent. As a percentage of gross national product in the same period, the value of oil imports increased from 2.1 per cent to 3.7 per cent for India and from 1.9 per cent to 3.1 per cent for Pakistan.

158. Similar estimates for middle- and upper-income developing ESCAP countries are even more dramatic. In Thailand and the Philippines, the value of oil imports between 1978 and 1980 more than doubled. In Thailand, the value of oil imports as a percentage of total imports increased from 11 to 27 per cent between the two observations and in the Philippines the comparable figures were 17 and 30 per cent. As a percentage of gross national product, the value of oil imports increased from 5.5 per cent to 9.8 per cent between 1978 and 1980 for Thailand and from 4.2 to 7.1 per cent for the Philippines. The Republic of Korea is another country severely tested by the cost of oil imports. Between 1978 and 1980 the value of its oil import bill increased by approximately 150 per cent. Oil imports as a percentage of total imports increased from 14 to 23 per cent between the same dates and as a percentage of gross national product moved from 5.6 per cent to 9.3 per cent.[24]

159. In view of the escalation in oil prices, considerable pressures on the balance of payments and possibly absolute declines in foreign exchange holdings of more developing ESCAP economies can be expected. This is the case particularly for several low-income developing countries which lack a strong export base or which are still mobilizing their export potential. Financial resource inflows from all sources are therefore of crucial importance to these economies and, more generally, to the developing non-oil exporters of the ESCAP region.

160. Table 25 indicates that, with the exception of 1977, the net flow of external resources to developing ESCAP countries between 1976 and 1979 remained stable in nominal terms but decreased markedly in real terms. Except for 1977, the net flow of resources approximated $US 10 billion per annum. However, the drop in real purchasing power of this financial flow to the developing ESCAP region can be approximated by applying the world export price index for manufactures to the nominal value of the flow. From 1976 to 1979 the world prices of manufactured exports increased by more than 40 per cent, thus indicating that the net resource flow to developing ESCAP economies was reduced by nearly one third in real terms.

161. Apart from the dramatic decline in the real value of resource flows, there have been noteworthy variations in the composition of total net flows between 1976 and 1979. As a share of the total, official development assistance (ODA) varied moderately, fluctuating between 52 and 62 per cent.

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[23] International Monetary Fund, *International Financial Statistics* (November 1980); total reserves excluding gold.

[24] OECD, *Development Co-operation: 1980 Review* (Paris, 1980), table IV–6, p. 79. Total imports include services; all figures cited for 1980 are estimates.

Table 24. Developing ESCAP economies. Balance of payments summaries. 1975-1979

($US millions)

Country	*Year*	*Current account balance*[a]	*Official capital and transfers*	*Private long-term capital*	*Basic balance*	*Short-term capital and E and O*[b]	*Over-all balance*	*Change in reserves (– = increase)*
Oil exporters								
Indonesia	1975	–1 136	594	476	–66	–846	–912	905
	1976	–923	1 653	344	1 074	–163	911	–913
	1977	–74	1 280	235	1 441	–424	1 017	–1 017
	1978	–1 480	1 232	382	134	–16	118	–117
	1979	923	1 144	276	2 343	–908	1 435	–1 436
Iran	1975	4 725	–3 027	141	1 839	–1 727	112	–110
	1976	4 733	–2 599	744	2 878	–2 940	–62	61
	1977	4 091	–450	802	5 443	–2 018	3 425	–3 424
Non-oil exporters								
South and west Asia								
Afghanistan . . .	1975	–99.5	99.8	—	0.3	52.2	52.5	–52.5
	1976	–40.1	93.2	—	53.1	11.6	64.7	–64.6
	1977	–107.1	175.3	—	68.2	86.4	154.6	–154.6
	1978	–184.5	195.6	—	11.1	87.7	98.8	–98.8
Bangladesh . . .	1975	–950.7	953.9	—	3.2	–37.2	–34.0	33.9
	1976	–435.1	496.4	—	61.3	8.2	69.5	–69.5
	1977	–625.2	632.9	—	7.7	–28.6	–20.9	20.9
	1978	–853.2	868.9	—	15.7	82.1	97.8	–97.5
Burma	1975	–94.9	55.5	—	–39.4	–12.8	–52.2	52.3
	1976	–48.6	35.6	—	–13.0	5.8	–7.2	7.2
	1977	–110.2	76.0	—	–34.2	–2.9	–37.1	37.2
	1978	–240.4	218.4	—	–22.0	–0.2	–22.2	22.3
	1979	–405.9	472.3	—	66.4	48.6	115.0	–115.0
India	1975	–342	1 134	–11	781	–493	288	–287
	1976	1 174	1 435	–8	2 601	–411	2 190	–2 192
	1977	1 738	1 017	—	2 755	–204	2 551	–2 551
Nepal	1976	–9.1	34.8	—	25.7	2.9	28.6	–28.4
	1977	–33.2	58.6	—	25.4	–14.3	11.1	–12.8
	1978	–64.3	55.3	—	–9.0	2.3	–6.7	1.2
	1979	–63.6	88.9	—	25.3	–12.8	12.5	–18.0
Pakistan	1975	–1 178	554	25	–599	405	–194	194
	1976	–892	543	8	–341	357	16	–16
	1977	–840	701	16	–123	100	–23	22
	1978	–822	550	27	–245	241	–4	—
	1979	–1 381	838	62	–481	381	–100	101
Sri Lanka	1975	–186.2	155.6	10.5	–20.1	–22.4	–42.5	41.5
	1976	–64.0	128.7	0.5	65.2	–19.5	45.7	–45.8
	1977	77.6	129.8	–1.0	206.4	7.2	209.6	–212.7
	1978	–122.6	172.2	2.1	51.7	23.9	75.6	–75.3
	1979	–372.4	268.4	46.9	–57.1	133.3	76.2	–75.9
East and south-east Asia								
Malaysia	1975	–460	118	616	274	–369	–95	95
	1976	639	182	348	1 169	–339	830	–830
	1977	503	200	542	1 245	–756	489	–488
	1978	221	107	602	930	–458	472	–472
	1979	1 362	156	1 068	2 586	–1 929	657	–658

Table 24 (*continued*)

Country	*Year*	*Current account balance*[a]	*Official capital and transfers*	*Private long-term capital*	*Basic balance*	*Short-term capital and E and O*[b]	*Over-all balance*	*Change in reserves (– = increase)*
Philippines	1975	—1 076	546	124	—406	390	—16	11
	1976	—1 224	1 115	142	33	—117	—84	85
	1977	—944	764	219	39	—86	—47	46
	1978	—1 272	957	163	—152	1 014	862	—862
	1979	—1 692	1 244	91	—357	796	439	—440
Republic of Korea . .	1975	—1 958	1 362	53	—543	919	376	—374
	1976	—460	1 332	149	1 021	293	1 314	—1 313
	1977	—50	1 310	143	1 403	—48	1 355	—1 356
	1978	—1 125	2 048	103	1 026	—315	711	—711
	1979	—4 193	3 097	23	—1 073	1 969	896	—895
Singapore	1975	—605	57	611	63	131	194	—195
	1976	—701	77	687	63	294	357	—357
	1977	—471	60	456	45	446	491	—493
	1978	—753	—18	511	—260	1 705	1 445	—1 446
	1979	—1 174	336	802	—36	552	516	—515
Thailand	1975	—631	192	87	—352	250	—102	101
	1976	—454	253	81	—120	244	124	—124
	1977	—1 122	341	103	—678	775	97	—97
	1978	—1 192	562	126	—504	672	168	—171
	1979	—2 117	1 282	232	—603	375	—228	228
Pacific								
Fiji	1975	—26.8	36.2	10.9	20.3	19.5	39.8	—39.8
	1976	—50.2	20.7	—	—29.5	—2.8	—32.3	32.2
	1977	—24.4	39.2	—	14.8	7.9	22.7	—22.7
	1978	—37.7	3.1	—	—34.6	21.7	—12.9	12.9
	1979	—99.1	58.5	10.2	—30.4	26.7	—3.7	3.6
Papua New Guinea .	1975	—276.4	317.1	34.5	75.2	—93.1	—17.9	18.0
	1976	—92.5	164.6	16.2	88.3	—39.7	48.6	—48.7
	1977	—113.5	280.0	13.5	180.0	—8.4	171.6	—171.5
	1978	—268.7	190.4	20.5	—57.9	68.4	10.5	—10.6
	1979	—190.4	261.5	38.2	109.3	6.3	115.6	—115.7
Tonga[c]	1975	381	3 421	36	3 838	—1 026	2 812	—2 812
	1976	—2 076	2 054	113	91	—1 409	—1 318	1 318
	1977	—2 072	1 667	—86	—491	2 952	2 461	—2 461
	1978	—604	2 568	94	2 058	809	2 867	—2 867
	1979	—2 130	1 404	262	—464	1 095	631	—631

Sources: International Monetary Fund, *International Financial Statistics*, November 1980; Asian Development Bank, *Key Indicators*, April 1980.

Notes: [a] Comprises merchandise trade, services and private transfers; excludes official transfers.

[b] Errors and omissions; also includes counterpart to SDR allocations and valuation changes, and balance-of-payment loans.

[c] $US thousands; year ending 30 June.

Table 25. Developing ESCAP economies. Net external financial flows, 1976-1979, by subregion
($US millions)

		Total net flows	*Net private flows from DAC countries*	*Net official flows (ODA)*			
				Total	*Multilateral agencies*	*OPEC*	*DAC countries*
West and south Asia . . .	1976	4 103.5	108.6	3 994.9	1 020.9	1 378.6	1 595.4
	1977	2 895.0	8.8	2 886.2	1 070.6	389.1	1 426.5
	1978	3 882.8	115.8	3 767.0	1 269.1	337.0	2 160.9
	1979	4 171.1	143.2	4 027.9	1 328.9	116.7	2 582.3
East and south-east Asia	1976	6 347.4	5 027.3	1 320.1	236.5	77.2	1 006.4
	1977	3 816.6	2 660.5	1 156.1	227.5	57.9	870.7
	1978	5 434.2	4 035.8	1 398.4	282.3	51.0	1 065.1
	1979	5 680.9	4 087.4	1 593.5	278.4	36.5	1 278.6
Pacific	1976	372.4	57.6	314.8	17.9	—	296.9
	1977	380.8	40.6	340.2	30.4	—	309.8
	1978	461.2	58.0	403.2	42.2	—	361.0
	1979	502.7	86.8	415.9	34.0	2.2	379.7
Grand total	1976	10 823.3	5 193.5	5 629.8	1 275.3	1 455.8	2 898.7
	1977	7 092.4	2 709.9	4 382.5	1 328.5	447.0	2 607.0
	1978	9 778.1	4 209.6	5 568.6	1 593.6	388.0	3 587.0
	1979	10 354.7	4 317.4	6 037.3	1 641.3	155.4	4 240.6

Source: OECD, *Development Co-operation: 1980 Review* (Paris, 1980), annex tables D.1–3 and G.7.

The components of ODA, however, altered appreciably. As a percentage of ODA, OPEC contributions declined from 26 per cent in 1976 to about 3 per cent in 1979. The decline in the share of OPEC in ODA was made up primarily by an increase in that of Development Assistance Committee (DAC) countries, while the share of multilateral institutions also increased modestly. Private capital flows continued to play an important role in the financing of balance-of-payments deficits; the share of private in total resource flows shows a distinct rise during 1976-1979 in comparison with the difficult years following the first oil shock.

162. There are marked differences among subregions in the ESCAP region with regard to the composition of capital flows. While the countries of west and south Asia absorbed approximately 40 per cent of total capital flows between 1976 and 1979, their share in ODA was around 70 per cent. During the same period the countries of east and south-east Asia absorbed some 56 per cent of total capital flows, accounting for about one tenth of total ODA but for over 96 per cent of private capital flows. The countries of south Asia absorbed only a little more than 2 per cent of total net private capital flows. Finally, the countries of the South Pacific continued to be heavily dependent upon external financial resource inflows. Among the country groups indicated, they alone received increasing amounts of both private capital flows and ODA between 1976 and 1979.

163. Many countries have had recourse to the international money market, including the off-shore Eurodollar market, for short- to medium-term financing purposes. The value of such bridging loans granted to developing ESCAP member economies has increased significantly over the past few years. However, there have been considerable yearly variations which probably reflect the changing fortunes of the export sector, and hence the need for additional short-term financial resources. For example, the amount of Euro-currency credits going to the developing ESCAP countries in 1979, a year of good export earnings, fell by 22 per cent, to just below $US 6.6 billion. The credits outstanding for 1980 are likely to increase appreciably over the level of a year earlier to cover shortfalls in the export receipts of several developing countries in the ESCAP region.

164. Generally, the east and south-east Asian countries, particularly the Republic of Korea, the Philippines, Malaysia and Indonesia, have been the heaviest borrowers from this short- to medium-term credit facility. Medium- to long-term financing, however, can be obtained through the international

bond market. However, this kind of external financing has been of much less importance than the financial flows to the developing ESCAP region from the off-shore dollar market. The annual value of bond issues remained almost stationary at between $US 630 million and $US 680 million during 1977-1979.

165. The total external debt of most developing countries in the ESCAP region has grown considerably in recent years. Although up-to-date statistics of debt service ratios are not comprehensive, preliminary information appears to indicate that these ratios, while highly variable, have generally been rising for the ASEAN group of countries and for the two principal economies in the Pacific. In particular, the debt service ratios of the Philippines, the Republic of Korea and Malaysia, which ranged between 9 and 14 per cent of the value of their respective exports in 1978, were about two to three times larger than those of other countries in these two areas. The debt service ratios of the south Asian economies, while not at all uniform, are comparatively much higher than those of other developing ESCAP economies.

166. The prospects for vitally needed increases in external resource flows are not promising. The World Bank estimates that by 1990 only 0.5 per cent of the gross national product of the industrial economies will be made available to the developing countries and this percentage is disappointing both in terms of the ODA target set for the United Nations Third Development Decade and in comparison with historical levels attained in the 1970s.[25] This gloomy projection is based on a number of factors, including the current attitudes of the donor countries to the question of foreign assistance, their preoccupation in many instances with their own balance-of-payments problems, the investment requirements for the industrial restructuring of their economies and the need to develop alternative energy sources.

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[25] World Bank, *World Development Report, 1980*, p. 25.

V. INFLATION, POLICY CONSIDERATIONS AND THE OUTLOOK FOR 1981

167. Reference has earlier been made to the patterns of price changes which have occurred during the past two years in the developing economies of the Asian and Pacific region. The more comprehensive data presented in table 26 include separate series for food items in the consumer price index and wherever available a series for wholesale prices as well. Though scarcely requiring further emphasis, these additional data confirm the observation that a resurgence of inflation has occurred in most of the developing economies of the region during the past two years. As noted earlier, casual comparison of recorded rates of inflation, while it has a useful descriptive function, probably raises more questions than it answers. Although common causes may be cited, the complex of causal forces which have engendered inflation in any particular country would have to be considered in the particular circumstances of that country if meaningful policy implications are to be drawn.

168. This renewed wave of inflation is disturbing as it carries with it further stresses and dislocations in the domestic economy and pre-empts the attention of policy makers and decision takers. Although there is wide variation among the region's countries in the observed rates of price increases, the threat of potential worsening of inflationary pressures is omnipresent and hence affects policy decisions even in countries which have thus far suffered relatively little inflation. Although it is small consolation for countries grappling with persistent inflationary pressures, it may be noted that in comparison with other developing countries the over-all rate of inflation in the developing ESCAP countries is fairly moderate. Thus, for all non-oil developing countries, the rate of increase in consumer prices in 1979 and early 1980 has been estimated at approximately 30 per cent per annum; even if the countries with extremely high rates of inflation are excluded, the global figure is some 22 per cent. Reference to the median rates for sub-regional groups in the developing ESCAP region in table 8 above (see chapter II) provides material for a rough comparison. In the 12 months to June 1980, the median rate for six countries of south Asia approached 12 per cent; for seven economies in east and south-east Asia the median rate for the same period exceeded 17 per cent and fell slightly below that rate during the 12 months to September; among five Pacific island economies the median rate of consumer price increase had risen from about 6 per cent in 1978 to nearly 8 per cent per year in 1979.

169. The proximate causes of the marked increase in the incidence of inflation varied from country to country but there were causes common to many economies. All oil-importing countries have been seriously affected by the sharp oil price increases of the last two years. The increase in the price of petroleum products affects the general price level directly but also indirectly in so far as it raises production costs, distribution margins and the cost of energy substitutes and creates an unfortunate climate of expectations about future price increases.[26] Generally expansionary monetary policies were another source of inflationary pressure common to most countries in the region in 1979 and 1980. While the income elasticity of demand for money varies significantly from country to country, depending upon the degree of monetization of the economy, domestic market linkages and the development of financial institutions, an elasticity coefficient of about 1.5 is probably an acceptable generalization for developing ESCAP countries. Rates of monetary expansion well in excess of 150 per cent of the rate of growth in real output may be expected to have an inflationary impact. Available evidence suggests that rates of monetary growth of this order have prevailed in many developing ESCAP countries in 1979 and 1980. Apart from financing increases in real output, however, all countries have had to expand the supply of money to accommodate the increase in import prices owing to oil price increases and inflation in the industrial economies. Another common cause of inflation has been excessively expansionary fiscal policies, especially in south Asia. Finally, there have been other less widespread causes of price rises such as increases in tax rates or administered prices, the removal of subsidies, shortages in food supplies, exchange rate alterations and cost-push factors.

170. The outlook for 1981 is for some abatement in inflation in developing ESCAP countries. Oil prices are not expected to increase as rapidly as in the last two years and in a number of countries steps are being taken to adopt less expansionary and in some cases restrictive monetary and fiscal policies.

171. One possibly significant difference between the pattern of inflationary price increases in the last two years and the earlier inflationary upswing in 1972-1974 is the role of food prices in the rise in levels of the general consumer price idex (CPI). During

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[26] No further treatment of the energy situation is given here as short-term energy issues are considered in part two of this *Survey*.

Table 26. Developing ESCAP economies. Price changes, 1976-1980

(Average annual percentage change)

Key: C: consumer prices, all items; F: consumer prices, food;
W: wholesale prices[a]

		1976	1977	1978	1979	1980			
						12 months to			
						June	*July*	*August*	*September*
South Asia									
Bangladesh*	C	−9.6	10.4	13.2	12.7	15.5			
	F	−19.5	10.1	13.5	12.7	18.5			
	W[b]	−8.7	1.5	16.0	3.2	...			
Burma*	C	25.8	−3.8	−6.1	5.7	5.0			
	F	17.8	−3.0	−7.3	5.6	7.9			
	W[c]	15.6	−12.1	−8.8	4.5	7.4			
India	C	−7.8	8.4	2.5	6.4	9.8			
	F	−12.6	10.0	0.9	4.6	...			
	W	−1.9	7.5	−0.3	11.5	19.9			
Nepal	C	−2.0	8.5	5.6	6.2	12.8			
	F	−7.3	12.8	5.4	5.8	14.1			
Pakistan	C	7.2	10.1	6.7	9.4	10.4	10.4		10.4
	F	6.0	11.3	5.6	5.6	6.4	6.3		6.4
	W	8.6	11.3	5.2	7.4	9.8	9.5		
Sri Lanka*	C	1.2	1.2	12.1	10.8	19.0		23.2	24.1
	F	−1.1	0.6	16.9	10.8	20.8		25.1	26.3
	W	8.1	31.0	7.4	9.0	23.8			
South-east Asia									
Indonesia*	C	19.8	11.0	8.3 ‖	18.9	21.5			18.3
	F	22.1	10.6	7.8 ‖	20.8	23.7			18.2
	W	14.6	14.1	9.7	52.1	48.6			
Malaysia (Peninsular)	C	2.6	4.7	4.9	5.5	4.9	5.1	5.5	
	F	2.1	5.4	5.0	2.3	2.5	2.6	2.9	
Philippines	C	9.2	9.9	7.3	16.5				
	F	9.2	9.6	6.3	15.1				
	W	9.2	9.9	6.8	18.3	22.2		21.2	
Philippines*	C	6.1	8.0	7.6	18.9	22.1			
Singapore	C	−1.9	3.2 ‖	4.1	4.0	7.7		9.5	9.6
	F	−6.1	4.9 ‖	6.0	2.8	6.9		7.5	7.7
	W	6.7	4.6	1.6	14.5	22.5			
Thailand*	C	4.9	8.5	8.7	10.3	17.4			19.5
	F	5.5	11.5	8.5	9.2	17.5			19.3
	W	4.0	5.3	4.7	12.9 ‖	19.5			20.1
East Asia									
Hong Kong	C	3.7	5.4	5.9	11.2	14.9	15.2		15.3
	F	2.9	6.5	7.0	11.5	11.9	15.2		
Republic of Korea	C	15.3	10.2	14.4	18.3	23.8		25.4	
	F	17.8	11.6	16.6	13.8	15.2		17.4	
	W	12.1	9.0	11.7	18.7	32.2		34.1	
Pacific									
Fiji	C	11.4	7.0	6.1	7.7	10.8			13.0
	F	3.2	7.5	5.2	6.0				
Papua New Guinea	C	7.8	4.4	5.8	5.7	9.3			
	F	4.6	3.7	4.1	4.6	12.0			
Samoa*	C	5.0	14.4	2.1	11.1				
	F	4.7	11.9	—	13.8				
Solomon Islands*	C	4.3	8.4 ‖	11.4	8.0	10.0			
	F	1.9	6.8 ‖	13.7	9.0	10.2			
Tonga	C	7.1	17.5	9.6	5.5				
	F	3.3	18.0	13.0	2.6				

Sources: United Nations, *Monthly Bulletin of Statistics*, vol. XXXIV, No. 12, December 1980, and national sources.

Notes: Vertical lines indicate discontinuity in series. Asterisk (*) denotes consumer price data for capital city.

[a] General wholesale price index except as noted.

[b] Industrial products.

[c] Agricultural commodities; year begins in April.

the earlier episode, prices of food-stuffs advanced rapidly even before the impact of the marked rise in primary commodity export prices and earnings on money incomes in the exporting economies began to exert its influence on the consumer price level. In such economies in 1972 and 1973, a comparison of the percentage changes in the food component of the CPI and those of the all-items index clearly reflected the generally more rapid rise in food prices. Given the relative weight of food items in consumer price indexes (in most countries in the range of 40 to 60 per cent of the total), the relationship is symptomatic of the influence of changes in food prices on the consumer price level.

172. The pattern of changes in food and general consumer prices during the last half of the decade is much less marked. Although the prices of food rose more rapidly in most countries in the region at some time during the last five years, very little concentration occurs in any year or sub-region.[27] In 1977 food prices rose at least 10 per cent more rapidly than the all-items CPI in three south Asian countries, in Peninsular Malaysia and Singapore and in the Republic of Korea. For the latter, however, food prices rose significantly faster than the general CPI in both the preceding and succeeding years as well. Partial data for 1980 show a notably more rapid relative increase in the food price index in Bangladesh, Burma, Nepal and Sri Lanka for the 12-month period to June 1980 and in Papua New Guinea for the same period. Except for Burma, for which no independent observation is available, the inference from the observed changes is supported by information confirming the occurrence of food shortages of some significance.

173. Of the several identifiable effects of rapid and sustained inflation, the erosion of the real earnings of wage and salary earners is doubtless the most serious in its implications for welfare. Among both urban and rural wage earners the effects of a serious reduction and particularly a protracted period of erosion in the real wage has virtually inescapable effects on motivation and productivity. Among urban workers, the increasingly widespread phenomenon of the second job, after regular working hours, at night or on weekends (so-called moonlighting) almost inescapably reduces workers' efficiency because of fatigue and contributes not only to the deterioration of the workers' health but also to the rate of industrial accidents.

174. For wage earners quite generally the progressive reduction in real earnings enforces greater economy in consumption. Studies of household expenditure patterns under inflationary conditions in a wide range of countries characteristically reveal evidence of recourse to cheaper foods and to decreased variation in diets; if prolonged, this deterioration in dietary quality can have deleterious effects on health and resistance to disease, efficiency in production and on the welfare of the population, as well as the popular sense of satisfaction with the diminished standard of living.

175. What would appear to be a fairly widespread reaction among Governments to some of the social implications of the reduction of real incomes because of sustained inflation is found in the diminishing adamancy towards raising wage and salary rates and stipulated minimum wage levels. As recently as the onset of the inflation of 1972-1974, which came in the train of the food crisis and the commodity export boom in this region, the wage-push argument was commonly cited as the most important reason for holding the line against wage increases. With the experience of several years of continuous inflation since that time, it has now become virtually standard practice to make periodic upward adjustments in wage and salary rates to compensate for the decline in purchasing power. Governments, characteristically the largest single employer of labour in the countries of the region, have come to accept the desirability of assuming responsibility as wage-leader in the economy, often supplementing their own actions to raise the pay of their employees with the promulgation of informal guidelines and recommendations to the private sector to follow suit to the extent and in the manner their circumstances permit.

176. Granted that such action contributes to the momentum of price increases in rough proportion to the volume of increased nominal income vis-à-vis that of the aggregate income stream, the alternative of forcing the working classes to bear a disproportionate share of the inflationary burden has generally been unacceptable. It remains a moot point whether the effective, if informal, institutionalization of an implicit wage-escalation clause in the labour contract substantially increases the level of inflationary expectations, thereby making more difficult the task of reducing the underlying inflationary potential. Coupled with substantive measures to raise productive effectiveness, efficiency in production and labour productivity, the policy of semi-automatic wage escalation has the advantage of avoiding some and perhaps most of the deterioration in the incentive to work that comes in train with the erosion of real earnings.

177. Policies that have been employed by Governments and central banks to cope with inflationary

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[27] Using as a rule of thumb roughly a 10 per cent difference in the annual percentage change, or one percentage point in the 10 per cent range.

pressures and with some of the least tolerable consequences of inflation have been fairly conventional for the most part. By the end of the 1970s, most countries in the region had weathered serious bouts with inflation during the middle years of the decade and had gained some familiarity with the strains and dislocations occasioned by rapid increases in the general price level. That experience provided useful lessons and created situations which required continuous monitoring and the development of institutions, channels of communication and flexible mechanisms for influencing major monetary variables and exercising partial control over them. By the end of the decade central banks in many if not most countries had a far better arsenal for the control of inflationary symptoms and the alleviation of excessive dislocations than had been the case less than a decade earlier.

178. During the inflationary episode which accompanied the international market upswing in 1972-1974 and the impact of the first oil shock, the means for enhanced central bank control, within limits which were not clearly demarcated, of the pace of monetary expansion were fairly widely established. Treasury bill systems were developed in conjunction with revision of bank reserve requirements as a means to make the bank rate effective in the control of the volume of commercial bank credit when banks and other financial intermediaries held significant volumes of T-bills or other official paper as a substantial part of their required reserves. Yet the limits of interest rate manipulation in the control of the volume of credit were dramatically made manifest during 1980 as inter-bank offer rates, bank rates and prime rates in major international financial centres were raised, fell and were raised again over the range of 20 to 12 and again to 20 per cent or more per annum between March, June-July and December.

179. Apart from the uncertainty spawned by such extreme variability, the influence of international interest rate changes of this magnitude upon the structure of interest rates and the cost of borrowing in international markets was sharply felt by those having recourse to international money markets, chiefly the countries of east and south-east Asia. Parallel changes in key rates were induced in the monetary systems of several developing economies in the region (e.g., Hong Kong, Malaysia, the Philippines, Singapore and Thailand) chiefly to protect the balance of payments from large outflows of short-term funds.

180. The unwanted effects of the necessity to adapt in substantial measure to the variations in international interest rates appear in the influence they exert on the level and structure of domestic interest rates. Although in some instances of rising rates the monetary authorities in countries in this region have been able to maintain consistency with policies of credit restraint, extreme fluctuations in international rates have been difficult to accommodate while maintaining domestic rates appropriate to the needs of domestic monetary policy. The second major disability incurred in this connexion appears in the indirect form of the interrelation between interest rates and exchange rates in the major developed market economies. The manipulation of interest and exchange rates by the countries that dominate international trade and finance has an indirect influence of substantial magnitude upon the exchange rates of their much smaller trading partners. Shifts in interest rates in international financial centres as a component of domestic monetary measures, give rise to shifts in exchange rates as short-term flows are attracted by the prospect of higher returns. Apart from the outflow of short-term funds from developing market economies, neither is the consequent variability in the rates of exchange between the domestic currency and the Deutschemark, United States dollar, Japanese yen and pound sterling accessible to control by the monetary authorities in the developing country, nor do the variations in relative exchange rates with several major trading partners have any objective relationship to the real value of the small trading country's currency in the trade in merchandise and international services. It has thus become apparent that the monetary authorities in few developing countries importantly dependent upon international trade have authoritative control over critically necessary instruments for the governance of their domestic monetary systems.

181. It has been noted in passing that the monetary authorities in many developing countries in the region have employed expansionary monetary policies during the past two years of resurgent inflation. In many if not most of the same countries fiscal policy has often been at least moderately expansionary as well. Doubtless the most common reason for the apparent conflict with the intention to control or at least to moderate substantially the pace of inflationary price developments is found in the desire to avoid choking off the expansion of productive investment and of production activity when markets for exports are expanding and the growth of domestic production and employment is a fundamental component in the national development effort.[28] Perhaps

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[28] The experience of the Republic of Korea during 1980 in the attempt to exercise strict control over monetary variables in order to reduce extreme inflationary pressures bears witness to this observation. Substantial relaxation of monetary controls in the knowledge that strong inflationary pressures would reassert themselves was apparently considered less hazardous than the consequences of mounting unemployment and industrial stagnation.

most commonly, monetary authorities have been inclined to bend with the wind and to exercise limited control over the volume and direction of credit. The degree to which such policies have been successful can scarcely be assessed as a general phenomenon but must be judged for each economy in its particular circumstances. There is ample evidence that while permitting monetary expansion often beyond the stipulated volume targets, the channelling of credit to particular types of borrower has been at least moderately successful. Characteristic of the groups of borrowers favoured by such policies have been those whose production and incomes are considered important for the achievement of national goals, such as small farmers and small businessmen, producer and housing co-operatives and specified industries sometimes in selected areas.

Outlook

182. For the developing ESCAP economies dependent upon export markets among the developed market economies, the prospects for export growth remain gloomy for 1981; even the optimistic forecasts of GNP growth in the industrialized countries do not anticipate a substantial general recovery before the end of the year, becoming more buoyant only during 1982. Access to markets in the developed economies will undoubtedly remain difficult throughout the year, particularly if the prognoses for continued high levels of unemployment are reasonably accurate. The prospects for individual commodity markets are extremely varied. Whereas demand in some markets will in all likelihood remain strong, even though prices may remain relatively unfavourable, the general pattern is likely presaged in the weakening which had begun during 1980, and in some cases earlier. Prices of foodgrains will presumably be well maintained in view of the anticipated shortage in world production. But few developing ESCAP countries are on the seller's side of the market and most of those dependent on food imports will have to face higher costs.

183. For the rest, the composition of exports from individual countries, the degree of diversification of their markets and their ability to expand production even in the prospect of lower prices will perforce determine their relative success in sustaining foreign exchange earnings from exports through what promises to be an extremely difficult period. The possibilities for the expansion of trade among developing countries remain to be thoroughly explored. Beyond that, the potential for planned co-ordination of investment, production and markets among subregional groupings has scarcely been investigated. Doubtless the greatest practical hindrance to progress in such an endeavour is its intractably prolonged period of gestation. There would seem to be little doubt that the renewed crisis is imminent.

184. The high price of oil and an abiding uncertainty in respect of supply for a considerable period after the eventual end of the war in the Gulf promise no foreseeable respite. Governments have reacted positively to the second oil shock; after the 1974 experience, many postponed what have become inescapable measures to adapt to permanently higher prices. In the period of gestation during which new sources of energy are developed and greater efficiency in energy use is gradually achieved, adaptation to higher relative costs of energy will inevitably occur whether by means of planned action or via market changes.

185. In important part, the consequence of far higher oil prices, of weakening markets for exports and of continued high and rising prices of other necessary imports will be balance-of-payments problems which will remain critical in many countries, including in particular the low-income countries. Even if modest rates of development are to materialize in these countries, they will require increased flows of concessional assistance. In the other affected middle-income developing countries of the region increased flows of finance on commercial terms and with greatly lengthened maturities will be urgently required. Quite apart from the problem of recycling balance-of-payments surpluses, however, the broader and critical issues are those of attaining a global solution to problems involving the welfare of all nations in the areas of international finance, trade and technology flows and of achieving a satisfactory level of global economic activity.

VI. DEVELOPMENTS IN SOCIALIST COUNTRIES OF THE ESCAP REGION

186. The socialist countries of the ESCAP region were not left unaffected by the unfavourable economic conditions and particularly the adverse weather conditions characteristic of 1980 for the region as a whole. Although the experience of the region's socialist countries was highly varied in 1980, at least three common factors determining the economic performance of all of them could be distiguished. The first is the impact of exceptionally difficult natural conditions on their agricultural production. The second relates to the role of economic reforms and strategic changes in economic planning priorities undertaken by almost all the socialist countries of the region. The third concerns the influence of increased political tensions and conflicts on the utilization of these countries' productive potential and resources.

187. The extremely bad weather conditions affected agricultural production in China, Viet Nam and Afghanistan with particular severity. Among the other socialist countries, environmental factors were also unfavourable to economic growth during 1980.

188. China's northern plain suffered its worst drought in half a century while flooding was widespread in the central and southern part of the country. As a result, wheat production in 1980 diminished by 4 million metric tons, a reduction of 6.7 per cent as compared with the previous year. The rice crop fell by almost 2 million tons, which was 1.9 per cent less than in 1979. Increased livestock production resulting from changes in land utilization (see comment below) supported the index of total agricultural output at the same level as in the previous year.[29]

189. The fall in grain production had extensive repercussions for the economy as a whole. It resulted directly in an increased dependence on grain imports, the implications of which are already being felt on the international market. According to some predictions,[30] China's grain imports for the 1980/81 crop year will reach 14 million tons. Increased rice imports are to be expected (100,000 tons had been contracted in Thailand by the end of 1980) as well as much larger oilseed purchases abroad. This development worked against China's balance of trade, which in other respects improved considerably in 1980, as indicated by one semi-official estimate that China's foreign trade deficit narrowed in 1980 to 800 million yuan from 3.1 billion yuan in 1979.[31]

190. The poor 1980 grain harvest was to a certain degree compensated for by increased livestock production (about 5 per cent above 1979) and a better cotton crop (up 1.8 per cent from the previous year). Cotton, in fact, is playing a continuously growing role in China's agricultural raw material exports to hard currency markets.

191. The severe consequences of exceptionally bad weather were also felt in Viet Nam. Between June and September 1980 typhoons destroyed over 40 per cent of the rice crop in the northern part of the country. These heavy losses could not have been compensated for by the improved harvest in the south. In view of stagnating production over the preceding four or five years and serious damage to agriculture in 1979, the national food deficit in 1980 increased considerably; some estimates indicate an increase of as much as 3 million tons in 1980. The deficit was partially compensated for by foreign purchases and food aid; the supply of grain from the Soviet Union in 1980 reached 860,000 tons. Foreign aid and food purchases diminished considerably the potentially disastrous consequences of the situation but did not eliminate the increased shortages of food and other consumer commodities on the domestic market.

192. Very poor agricultural performance was also experienced in Afghanistan. After the disastrous year of 1979, in which wheat production dropped by 21.8 per cent[32] and industrial crops by 28 per cent, the agricultural sector did not recover in 1980. The most recent data indicate zero growth in wheat production in 1980, leaving output 25 per cent below the level of 1976. The poor performance of 1979 was, however, due not only to bad weather conditions but also due to shortcomings in agricultural policy. This is why some reforms in the economic mechanism were announced for the 1980/81 fiscal year; it also explains why a 12 per cent annual increase in agricultural output was set for that year as a planning target.

193. There are indications that the Lao People's Democratic Republic and Mongolia achieved better results in agriculture in 1980 despite the fact that weather conditions were less favourable than the

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[29] All figures based on FAO, computer printouts, 7 December 1980.

[30] Far Eastern Economic Review, *Asia 1981 Yearbook* (Hong Kong, 1981), p. 125.

[31] *The Asian Wall Street Journal* (Hong Kong), 13 January 1981.

[32] FAO, computer printouts, 7 December 1980.

average for previous years. In the Lao People's Democratic Republic the programme announced in 1979 to achieve self-sufficiency in food in each province in two to three years was in process of gradual implementation. In 1980, some 25 per cent of rice land was irrigated, and the estimated annual rice deficit of 80,000 tons had diminished to 60,000 tons.

194. The rising trend in agricultural production in Mongolia characteristic of recent years was maintained in 1980, especially in grain and fodder production. For the period 1969-1979, fodder production increased twofold and the wheat crop rose more than 2.5 times. The number of livestock reached 24.3 million in 1979, an increase of 1.1 per cent over 1978; however, in 1980 blizzards killed 500,000 animals in the eastern province. Some 8.5 million head of livestock were raised from birth in 1980. Efforts were intensified, in co-operation with some other socialist countries, to turn virgin land in the northern part of the Gobi zone to good use. New investments in agriculture included such major Soviet-assisted projects as seven new grain farms and 20 mechanized dairies. The satisfactory performance of agriculture allowed Mongolia to maintain upward trends in other branches of the economy. The policy of modernizing the industrial structure was continued. Capital investment plans were overfulfilled by a small margin resulting in the initiation of 705 new industrial projects. The high growth rate of 12.9 per cent achieved in 1979 permitted an increase in industrial production only slightly below that of the preceding year.

195. The second major factor influencing the economic performance of socialist countries in the ESCAP region relates to the impact of economic reforms on the functioning of their economies. Various economic policy measures aimed at restructuring the planning and management mechanism were undertaken in 1980 in almost all socialist countries of the region. They were regarded as necessary countermeasures to the growing difficulties created in the preceding year by internal imbalances as well as unfavourable external conditions.

196. Profound changes in plan objectives and implementation were introduced in China. Two dimensions of these changes should be distinguished, one relating to revisions in strategic development priorities and the other concerning the system of management and organization of the institutional framework. In the sphere of industry, the new economic policy decisions changed the existing planning strategy for the proportions between heavy and light industries. The National People's Congress at its August-September meeting sanctioned new priorities in the setting of production targets in favour of consumer goods production and of agriculture. The heavy industry programmes (including the energy sector) have been limited and restructured with the aim of concentrating on productive sectors having more direct linkage with market needs. The new planning directions have been reflected in an investment policy favouring more labour-intensive, job-creating projects rather than highly capital-absorptive, long-gestation ventures. Because the basic changes in priorities had been introduced in 1979 (the revised 1979 plan was submitted to the Fifth National People's Congress in June 1979), the major shifts in economic proportions appeared in the 1979 record.

Table 27. China. Rate of growth in industry

(Percentage change from the previous year)

	1978	*1979*
Gross output of industry	13.4	8.5
Light industry	10.8	9.6
Heavy industry	15.5	7.6

Source: Government of China, *Main Indicators: Development of the National Economy of the People's Republic of China* (Beijing, 1980).

197. The changed proportions in the rate of growth of light and heavy industry (in favour of light industry), shown in table 27, were maintained in 1980. The increased rate of growth in the output of the consumer goods sector as compared with the producer goods sector resulted in changing shares for accumulation and consumption in favour of the latter. Over-all growth capacities for 1980 were therefore reduced in each major sector. Recent figures indicate that the rate of growth of GNP in 1980 was 5.5 per cent[33] as compared with 7 per cent achieved in 1979. The justification for the diminishing quantitative indicators of growth was that they were to be compensated for by qualitative improvements in the interrelations within industry as well as a strengthening and enriching of the country's external economic links. Exceptionally good performance was recorded in foreign trade in 1980 with a 27 per cent increase in exports. This contributed decisively to a narrowing of the trade deficit and was in part a beneficial result of the recently introduced policy changes. There are also indications that the rechannelling of investment resources to the small-scale industry and services sectors created an additional 20 million openings for job-seeking young people.

198. The shift in the proportions of industrial growth adversely affected the rate of expansion of such key branches of the economy as steel, coal

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[33] Far Eastern Economic Review, *Asia 1981 Yearbook* (Hong Kong, 1981), p. 128.

and oil production. Plans for 1980 envisaged zero growth for crude oil extraction and decreases in coal and in crude steel production by 3.9 and 10.4 per cent respectively. A directly perceptible result of these plans was a diminution in planned deliveries of oil to Japan (a reduction to 8.3 million tons as against the originally contracted 9.5 million tons for 1981) and postponement of any further substantial increase in deliveries until the mid-1980s. The reduction for 1982 is from the earlier agreed 15 million tons to only 8.1 million tons. The Government hopes that the problem of growing internal demand for energy, capital goods and other heavy-industry products will be solved mainly by better utilization of existing equipment, more economical use of raw materials and improvements in planning and enterprise management.

199. Profound changes in planning priorities have also taken place in agriculture. The reorientation of priorities has affected in the first instance the structure of agricultural land use. The former policy of converting low-yielding grass land to grain has been found inefficient and harmful for the economy as a whole. Instead, the reclamation of abandoned pastures and more extensive utilization of grass land has been recognized as a necessary condition for increased meat and milk production. One-sided development of grain production at the expense of cash-crop forestry, animal husbandry and fisheries has been proclaimed as counterproductive and upsetting to the ecological balance of the country. Attempts to decrease the share of grains in the structure of land cultivation unfortunately coincided with extremely bad weather conditions in the northern part of the country and widespread flooding in the south. This aggravated considerably the grain deficit of the country in 1980.

200. The strategy changes concerning the structure of the economy have created a need for adjustments in the methods of organization, management and planning. Some new economic mechanisms introduced in the industrial sector aim at establishing better conditions for economic calculations and encouraging more market-oriented decisions by enterprises. While maintaining centralized connexions (vertical linkages) between enterprises and the higher industrial authorities, much wider scope is being developed to permit horizontal linkages among enterprises. New forms of industrial organization have been introduced, including joint ventures based on international technological and financial co-operation. In agriculture, the traditional communes are being supplemented with more diversified agricultural working units with the dominant intent of making the agricultural teams more flexible and adaptable to the conditions of production. The policy of widely applying the concept of unified models of work organization (for instance, the Dazhai Production Brigade) is conceded to have been too rigid and not fitted to every region and the diverse conditions of agricultural production. Some experimental agricultural complexes based on a wage-payment system have been organized; and the agricultural free market has been given a new role in local-level trading.

201. The changes in short-term and long-term priorities as well as in methods of economic organization and management were reflected in the replacement of the existing 10-year plan (1976-1985) by a five-year plan for 1981-1985, which is to be incorporated into the new 10-year programme for 1981-1990.

202. New planning priorities and changes in the economic mechanism have had a considerable impact on the 1980 economic record of the Lao People's Democratic Republic. As a countermeasure to increased market disruption leading to a drastic slowdown in economic performance in 1979, a comprehensive programme of economic reforms was announced at the end of the year. Because most of the negative aspects of the economic development process in previous years had stemmed from the confused market situation, the core of the reform lies in changes in the existing price and monetary institutions. A currency reform was introduced before launching the first five-year plan (for 1981-1985). The Liberation Kip (LK) was replaced by the National Bank Kip (NBK) at the rate of LK 100 : NBK 1. The change was not merely a nominal one, as it was supplemented by some new monetary arrangements as well as price and earnings adjustments. The most important among the monetary decisions was the drastic devaluation of the NBK in relation to the American dollar from NBK 4 : $US 1 to NBK 16 : $US 1, followed by a revaluation to NBK 10 : $US 1.

203. The new price policy envisages various changes in the existing price relations to adjust them to new market conditions. This includes an increase in agricultural purchasing prices; for example, the price of some commodities, including rice, has been increased by 300 to 500 per cent. The price increase was accompanied by an increase in wages and salaries by 170 per cent. To give the existing price-earnings ratios true economic content and to avoid creating arbitrary and artificial price-cost relations, administrative barriers to domestic trade and commodities circulation were abolished. These and other reforms have had a great impact on internal economic conditions and have produced major results in a comparatively short time. Because the new

price relations are closer to those of Thailand, the country's major trading partner, the temptation of smuggling has been greatly discouraged. However, the value of commodities imported from Thailand through government channels doubled during 1980, despite the temporary border closure during July and August, which created serious local shortages.

204. The introduction of price incentives for producers and traders, both private operators and co-operatives, had a positive impact on agricultural commodity supplies and resulted in considerable improvement in the food market. The policy of consolidating existing agricultural co-operatives rather than creating new ones was also a factor increasing the efficiency and yield of marketable agricultural produce. Sounder market relations and some administrative measures encouraging small industry activities resulted in a 36 per cent increase in merchandise exports (from $US 35.2 million in 1979 to $US 48.2 million in 1980), although imports rose at the same time by 25 per cent (from $US 94.3 million to $US 118.3 million); in this context, the country's debt service ratio, which was already comparatively low, fell from 17 per cent in 1978 to 7 per cent in 1979 and 5 per cent in 1980.

205. More flexible and incentive-oriented price policy, particularly with respect to the agricultural market, has also been used as a remedy for deteriorating production conditions in Afghanistan. Higher purchase prices were announced by the Government in 1980 for cotton (20 per cent), beet (30 per cent) and certain other products. The response of producers might be limited, however, owing to the insufficient market orientation of agriculture and unsettled conditions in the country. Economic incentives in the existing situation could play only a supplementary role to the policy of economic and political stabilization and direct provision of financial and material aid to agriculture and other branches of the economy.

206. Encouragement of food production and increased export earnings were the main motives determining economic policy changes in Viet Nam during 1980. A new five-year quota system for obligatory agricultural deliveries from co-operatives was established in April 1980. Under this scheme, yearly deliveries may vary according to the harvest, while surpluses above the fixed quota may be sold on the open market. Annual flexibility was introduced into the five-year quotas to ensure the possibility of accumulation by co-operatives in bad agricultural years. The freely marketed surplus is to play the role of material incentive for fulfilment and over-fulfilment of plan targets. Production is being stimulated by the new price system for buying paddy from the individual farmer. In addition to considerable price increases, the new system permits the State to make part payment in goods instead of money. Payment in kind is considered to be necessary because of the shortages of the means of production for agriculture. Linkage between delivery of farm products and the supply of the means of production to the farms is considered the most effective way of directing scarce resources to the most efficient producers. Experience has shown that the new system has contributed positively to increase the supply of agricultural products and has proved more efficient than previous methods of direct administrative procurement of agricultural products from farmers.

207. The organization of foreign trade has also been subjected to considerable reform aimed at intensifying the export orientation of production. The establishment of the Hanoi Export and Import Corporation operating on commercial profit principles has proved successful. The Corporation increased the value of its exports by 85 per cent in the first half of 1980 and closed the period accounting for 12 per cent of Viet Nam's foreign trade. This successful experience might encourage new trends in the organization, planning and management of the foreign trade sector.

Part two

SHORT-TERM ECONOMIC POLICY ASPECTS OF THE ENERGY SITUATION IN THE ESCAP REGION

NOTE ON TECHNICAL TERMS AND MEASURES

Energy means capacity for performing work or generating heat, work and heat being convertible. *Work* is force applied to move mass over a given distance. The scientific unit of force is the *newton,* a force which imparts an acceleration of 1 metre per second to a mass of 1 kilogram (kg m/s^2); and the scientific unit of work is the *joule,* the work done by a force of 1 newton acting through a distance of 1 metre (kg m^2/s^2).

Power means the rate at which work is performed. Its scientific unit is the *watt,* equal to 1 joule per second (kg m^2/s^3).

Heat the alternative concept for energy, is scientifically measured by the gram-calorie, the heat required to raise the temperature of 1 gram of water from 14.5°C to 15.5°C at a pressure of 1 atmosphere. The conversion rate of heat to work is 1 gram-calorie = 4,184 joules.

Primary energy is any natural form of energy which has not been chemically transformed before use, and so means all energy which is used, directly and indirectly, to assist economic activities.

Secondary energy results from the transformation of primary energy into other forms of energy supplied to final users. It is less than primary energy by the losses involved in transforming primary energy into secondary forms and in transmitting these to final users. Such losses can be 75 per cent or more of primary energy in the case of electricity and diesel engines.

Useful energy is that which results in work or heat for use in economic activities, or secondary energy discounted for inefficiency in its utilization by final users. Such inefficiency can involve considerable losses but information about it is too sparse for any aggregate estimates to have been made.

Practical measures

The joule is a very small unit of energy so that, for macro-purposes, it is convenient to measure energy in terms of a billion joules (10^9 J) called a *gigajoule* (GJ) or a trillion joules (10^{12} J) called a *terajoule* (TJ). Similarly, a watt is so small a unit of power that use is made of the *kilowatt-hour* (kWh) equal to 3,600,000 joules as a joule is a watt per second.

The alternative measure of energy in terms of heat, the calorie, is again too small for macro-purposes so that use is made of the large kilo-calorie or *Calorie* (kcal) equal to 1,000 calories or 4,186.8 joules.

Practical measures run in terms of metric tons of oil or coal equivalents, the equivalents being obtained by estimates of the calorific content of the fuels involved. Unfortunately, neither crude oil supplies nor coal supplies are of uniform calorific content so that such measures cannot be made precise except by impossibly detailed study. The World Bank[a] has used world averages to give the following approximate conversion rates:

1 ton of crude oil = 1.5 tons of coal
= 1,167 cubic metres of natural gas
= 12,000 kilowatt-hours of electricity (calorific)
= 10.5 million kcals
= 43.08 gigajoules.

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[a] World Bank, *Energy in the Developing Countries* (Washington D.C., August 1980).

INTRODUCTION

1. The developing ESCAP region has had to depend on imports to provide the bulk of its commercial energy supplies. World price and output trends for petroleum, the region's most important imported energy source, have had their repercussions on the developing ESCAP economies. With the very real prospect of continuing increases in petroleum prices the developing ESCAP countries have voiced concern, in many ESCAP and other international forums, about the energy problem and its relevance to the achievement of their socio-economic objectives. In view of this expressed concern, the subject of energy was designated as the main theme for the 1981 session of the Commission.

2. Specific concern has been expressed by developing member countries about the short-term economic policy issues which need to be resolved both in the energy sector and for the economy as a whole consequent on developments in the energy sector. Therefore, the secretariat report has placed primary emphasis on the short term (defined as up to five years), although within the longer-term perspective of the energy situation in the developing ESCAP region.

3. Separate attention has also been given in the report to the situation in, and problems of, the developing member countries of the South Pacific because of their unique circumstances arising mainly from their geographic circumstances and their indigenous energy potentials.

4. Owing to lack of data and information the report does not fully cover all economies in the developing ESCAP region, more particularly those of the region's centrally-planned economies.

5. In order to assist the secretariat in delineating the scope of the secretariat report to the Commission, an *Ad Hoc* Advisory Group of senior policy-makers in the field of energy in the developing ESCAP region was convened in Bangkok from 7 to 8 June 1980.

6. The draft secretariat report was discussed by the High-level Expert Group Meeting on Short-term Economic Policy Aspects of the Energy Situation in the ESCAP Region (16-17 January 1981, Bangkok). The report of the Expert Group was submitted for the consideration of the Committee on Development Planning (2-6 March 1981, Bangkok) along with the draft secretariat report. The secretariat report and the report of the Committee provided the basis for the deliberations of the 1981 session of the Commission on this problem.

7. In this secretariat report on energy problems in the developing ESCAP region it is argued that the world now faces a new energy transition from present reliance upon petroleum as the major commercial source of power to the development of alternative sources, including new forms of renewable energy. For the region, moreover, this new transition is coming before member countries have completed their adjustment from heavy reliance, in predominantly rural areas, upon simple, traditional forms of energy.

8. Nor can the new transition be a quick one for the region. Petroleum, for the region as well as for the world, has become the major source of commercial energy and has been vital to its modern economic progress. Technical and structural rigidities work against quick substitution of coal, hydropower or nuclear power for petroleum, and there are long lead times in developing such alternative sources. Development of renewable forms of energy — biomass, solar, wind, tidal or ocean-thermal power — are still in the stage of experiment or micro-application. There can, accordingly, be little expectation of much lessened dependence on petroleum for another decade.

9. The region's energy problem has three main aspects. First, to find and apply methods of conserving both petroleum and other currently available sources of energy, i.e. to use all of them more efficiently in transforming primary into secondary energy, in transmitting or distributing secondary energy, and in using secondary energy for heat, mechanical work or electric power. Secondly, to substitute as quickly as possible, but within economic bounds, other sources of primary energy for petroleum in anticipation of further rises in its real price. Thirdly, to develop, again as rapidly as possible but within economic bounds, supplies of coal and hydroelectricity and new ways of using effectively the various forms of renewable energy.

10. The second and, more particularly, the third aspect are longer term in regard to prospective results but that is all the more reason for immediate preparation of adequate plans in regard to them and for quick action on those plans. For, bad as the energy situation of the region may have become

through higher real prices for petroleum, it could become worse as finite reserves of this key mineral approach exhaustion. Sooner or later the world must run out of petroleum and the indications are that this will occur sooner rather than later. If modern economies are to continue functioning properly, and if developing economies are to retain, let alone improve, their present economic achievements, substitutes for petroleum must be found. The more quickly the developing ESCAP countries find or use such substitutes, the less will be the threat to their economic progress from dwindling flows of petroleum.

11. Chapter I surveys the recent position of those countries in regard to demands for energy and supplies of energy, and chapter II the impacts of the 1973-1974 jump in oil prices upon their rates of inflation, foreign trade, balances of payments and productive activities. They argue that developing ESCAP countries overcame the short-term effects of dearer petroleum surprisingly well but at the cost of heavy increases of external indebtedness which must add to the heavier burden put on their export receipts by dearer petroleum. It is thus going to be more difficult to cope with the second big rise in the real price of petroleum of 1979-1980, and the expectation is that further substantial rises will come as petroleum becomes scarcer.

12. Chapter III considers short-term management of energy demands and supplies by developing ESCAP countries since 1973-1974, and draws some conclusions which may be helpful in regard to current and prospective energy problems. Chapter IV looks at methods of planning and implementing energy policies, stressing that short-term policies of conserving energy and improving the efficiency of its use, urgent though they undoubtedly are, cannot have full or lasting benefits unless they are adequately geared to comprehensive, long-term plans for energy in all its major aspects.

13. Chapter V looks at the energy problems of those Pacific island countries which are members of ESCAP. Their situation is rather a special one in that they are almost entirely dependent upon petroleum for commercial energy and they have a particularly strong need for it because of their extraordinary requirements for transportation. Problems of finding alternative sources of energy, moreover, are much more acute in most of these island countries than in other parts of the region.

14. Chapter VI deals with possibilities of regional, interregional and international co-operation for easing the energy problems of developing ESCAP countries. It finds that there are real possibilities of effective action in this regard, and offers suggestions for realizing them.

I. THE ENERGY SITUATION IN DEVELOPING ESCAP COUNTRIES

A. TRADITIONAL SOURCES OF ENERGY

15. Some natural forms and simple uses of non-human energy go back to remote prehistoric times. Wood, plant wastes and dung were then used for cooking and heating, sunshine for drying bricks, fruits, nuts, meat or fish, winds to drive sailing vessels and animals for carrying goods or drawing ploughs and carts. Long before the Industrial Revolution charcoal, peat, coal and coke had come to supplement biomass sources of energy for generating heat in households, bakeries, breweries, iron works etc., and wind- or water-mills had harnessed atmospheric or hydraulic energy for driving simple machinery in grain mills or textile factories. These uses of power were undoubtedly important but are difficult to measure in any complete way for earlier times. Some old statistics can be found for wood and coal but hardly any for other traditional forms of non-human energy. As late as 1850, however, and in the United States of America, wood was nine times as important as coal in furnishing energy, and there were no other mineral fuels at that date.[1]

16. Traditional or non-commercial fuels are still important in most developing countries. A recent study made by the World Bank[2] finds that about three quarters of their people use traditional fuels for cooking and that these fuels supply a quarter of the total energy used in developing countries. Another recent study, commissioned by the Asian Development Bank (ADB),[3] indicates that in Afghanistan, Burma and Nepal more than 70 per cent of the total energy used comes from traditional sources, in Bangladesh, Pakistan and Papua New Guinea, 50 to 70 per cent, and in Fiji, India, Indonesia, the Philippines, Sri Lanka and Thailand, 30 to 50 per cent. However, in Malaysia, the proportion may have fallen to 19 per cent, and in the Republic of Korea to only 7 per cent; it is, of course, negligible in crowded, urbanized Hong Kong and Singapore.

17. Biofuels are used mainly for cooking in rural Asia, and only in Nepal and the Republic of Korea have they been important for heating purposes. Wood or its derivative, charcoal, is preferred to other biofuels because it gives more heat for a given weight and a higher temperature. It is the main fuel in rural south-east Asia, where heavy rainfall creates high yields of cellulosic materials; wood is also the major fuel in rural India. Towards the north and west of south-east Asia, however, population becomes denser so that the availability of firewood decreases but agriculture provides sufficient wastes of straw, sticks, paddy husks, coconut husks or dung to serve as household fuel, a pattern noticeable in Bangladesh and formerly in the Republic of Korea. Yet most Asian countries use a mixture of biofuels as in India where it has been estimated that, in 1973/74, *per capita* consumption of wood and charcoal, for all energy purposes, was 151.2 kgs, of other solid fuels than coal or coke 4.9 kgs and of dung 25.2 kgs.[4] In Thailand, however, wood and charcoal are almost the only domestic fuels in rural areas.

18. Some biofuels, mainly bagasse and paddy husk, are used in industry or commerce as well as in rural households. Thus it has been estimated that they provide 25 per cent of the energy used by industry in both Pakistan and Thailand, and 29 per cent in Indonesia.[5] Most of this biofuel would be used by processing industries for which it is a by-product, and especially bagasse for sugar mills and paddy husk for rice mills.

19. If biofuels are still an important source of energy in rural Asia, their importance appears to have been diminishing in most developing ESCAP countries. The share of non-commercial to total energy has been estimated as falling, between 1960 and 1978, from 62 to 49 per cent in Indonesia, from 58 to 50 per cent in Pakistan, from 42 to 19 per cent in Malaysia, from 56 to 35 per cent in the Philippines, from 53 to 46 per cent in Sri Lanka and from 72 to 35 per cent in Thailand.[6] The reasons for this are mainly increasing population and the relative decline of the rural sector as industrialization and modernization of economies gather momentum.

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[1] Sam H. Schurr and Bruce C. Netschart, *Energy in the United States, 1850–1975* (Baltimore, Johns Hopkins University Press, 1960), p. 47.

[2] World Bank, *Energy in the Developing Countries* (Washington D.C., August 1980), p. 38. No statistics are offered in support of these findings.

[3] Coopers and Lybrand Associates, Limited, *Survey of Energy Utilisation* (Manila, ADB, March 1980), vol. 1, table 1.11. Its authors rightly stress that estimates of traditional sources of energy have defects of reporting and sampling which make most of them rather doubtful. They themselves err, in the direction of under-estimation, by treating, in some cases, unavailability of an estimate for a particular traditional fuel as a zero estimate.

[4] Ashok V. Desai, *India's Energy Economy: Facts and Interpretation* (Bombay, Centre for Monitoring Indian Economy, February 1980), p. 45.

[5] Coopers and Lybrand Associates, Limited, *op. cit.*, vol. 2, pp. 143, 278 and 416.

[6] *Ibid.*, vol. 1, p. 241.

20. Increasing population puts pressure on existing sources of biofuels and modernization leads to growth of urban centres the perimeter areas of which cannot supply nearly enough biofuels for townspeople. They have, accordingly, to resort to commercial types of energy, mainly kerosene but, for wealthier households connected to a grid, also to electricity. For both town and rural people kerosene is a cheap, efficient and versatile illuminant, but it is a relatively expensive cooking fuel so that rural people, whose incomes are, in any case, well below those of most townspeople, continue to use mainly biofuels for cooking purposes.

21. The result has been increasing pressure on forest areas and more diversion of animal wastes from manuring land to providing household fuel. Concern has been expressed about consequent deforestation and impairment of soil fertility. There is even talk of rural Asia facing a "second energy crisis"[7] on this account; secondary, that is, to the recent rise in the real prices of crude petroleum and its products.

22. Yet there are possible mitigations as economies in the use of traditional fuels could be obtained in a number of ways. Substitution of aluminium cooking utensils for earthen ones have, as in India,[8] raised the efficiency of traditional fuels in their major rural use. Their efficiency can also be improved by enclosing fires, and using devices which control the rate of combustion or store heat. Fuel requirements also vary with the method of cooking and the type of food. Baking and roasting use more energy than boiling and stewing so that foods like rice, which is normally boiled, require less energy than those like wheat, which is baked as bread or cake. There are, too, economies of scale in cooking in the sense that a larger number of people need less fuel per head for preparing their food than does a smaller number of people. All these economies in the use of biofuels for cooking, their major present use, may contribute to the explanation of a declining share of traditional energy in total energy, and also point to ways of easing the "second energy crisis".

23. Biomass sources of energy may also be made to help ease the major fuel crisis. Already they are being processed in digesters which, by anaerobic degradation of vegetable matter, manure and sewage, produce methane gas or, by fermentation and distillation of sugarcane, cassava, sorghum or other vegetable matter, produce ethanol. Methane can be used directly in cooking, and so reduce the demand for firewood or dung; it has the further advantage that the processed material loses none of its value as fertilizer. If compressed to give a satisfactory volumetric energy content it is useful as a transport fuel, and ethanol has important advantages in that respect; it can be blended with gasolene for any internal combustion engine (up to 15 per cent) or it can be wholly substituted for gasolene in specially modified engines.[9]

24. In rural India, small digesters of 2-3 cubic metres capacity have been used to produce methane, mainly from cow dung and on a household basis. Their capital cost has been relatively high; frequent maintenance problems have restricted capacity use as have seasonal variations in the supply of wastes. It is said, therefore, that they have been barely competitive, at best, with kerosene for cooking purposes.[10] Yet in China somewhat larger digesters of 8-10 cubic metres have a relatively low capital cost of about $70 and are now fully competitive with kerosene. Papua New Guinea is developing quite large digesters of 2,500 cubic metres or more in the belief that they can be economic for some industrial or institutional uses of power.

B. ENERGY TRANSITIONS

25. The Industrial Revolution was basically characterized by machine production and mechanical transport, both requiring sources of power. Its early energy basis was fuelwood but the demand soon outstripped the supply so that coal replaced wood as the dominant source of primary energy. During this first transition the share of coal in the total energy consumption of the United States rose from 9 per cent in 1850 to 77 per cent in 1910 while that of fuelwood declined from 91 to 11 per cent.[11]

26. Then a second energy transition began, from coal to crude petroleum and natural gas contributions of which to energy consumption began in the 1880s. By 1910 they were contributing 9 per cent to the consumption of primary energy in the United States and by 1950 over 55 per cent as against 37 per cent for coal.[12] At that date, 50 per cent of crude petroleum went to commercial transport, 23 per cent to household uses which included operation of cars, 20 per cent to industry and 5 per cent to thermal electricity plants.

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[7] World Bank, *op. cit.*, p. 38.

[8] Ashok V. Desai, *Inter-fuel Substitution in the Indian Economy* (New Delhi, National Council for Applied Economic Research, March 1980), p. 106.

[9] Valentine, Laurie and Davies Pty. Ltd., "A general survey of industry energy usage and substitution possibilities" (October 1980) (report specially prepared for the ESCAP secretariat), p. 28.

[10] Ashok V. Desai, *Impacts of Higher Oil Prices in India* (Geneva, ILO, September 1980), p. 67.

[11] Schurr and Netschart, *op. cit.*, p. 145.

[12] Sam H. Schurr (ed.), *Energy, Economic Growth and the Environment* (Baltimore, Johns Hopkins University Press, 1972), p. 158.

27. Petroleum and natural gas, however, had not become the major sources of primary energy for the world as a whole; in 1950 they contributed 37 per cent of world consumption of primary commercial energy, whereas solid fuels contributed 62 per cent and hydroelectricity less than 2 per cent. There was a dramatic further transition from solid to liquid fuels during the next two decades (see table 1). Crude petroleum, liquefied petroleum gas and natural gas came to supply two thirds of the world's consumption of primary energy and solid fuels less than one third.

28. It is remarkable how closely the developing countries of Asia, as a whole, followed this second energy transition. In 1950 solid fuels (excluding firewood, bagasse, rice husks and other traditional or non-commercial fuels) supplied 71 per cent of their consumption of commercial energy but, by 1973, only 36 per cent. The contribution of liquid fuels and natural gas rose compensatingly from 27 to 61 per cent and, even after the price of crude petroleum was sharply raised in 1973-1974, the transition went a bit further to raise their share to 65 per cent in 1978.

29. The general predominance of petroleum products among primary commercial sources of energy is shown in table 2 covering 15 developing ESCAP economies. The table also shows the relative decline in the use of petroleum in them during the 1970s. Petroleum, in 1970, had furnished more than three quarters of commercial primary energy in all of them except Afghanistan, Bangladesh, India, Indonesia, Pakistan and the Republic of Korea. For Fiji, Hong Kong and Singapore it was virtually the only source of commercial energy although Fiji, like south Asian countries, used a good deal of non-commercial energy in the form of bagasse and wood. Coal was much more important than petroleum in India and almost as important in the Republic of Korea. Hydroelectricity furnished as much as 4 per cent of commercial primary energy only in Afghanistan, Papua New Guinea and Sri Lanka. But the allied product of petroleum, natural gas, furnished more than a third of commercial primary energy in Bangladesh and Pakistan, and nearly a third in Indonesia.

30. By 1978 petroleum's share had significantly increased only in Afghanistan, India (which had expanded its own output of crude oil), Indonesia and the Republic of Korea. The share was almost stationary in Hong Kong, Papua New Guinea, the Philippines, Singapore and Thailand. Falls for Burma, Malaysia and Pakistan were balanced by rises in the share of the allied commodity, natural gas; and falls in Bangladesh and Nepal were more than balanced by rises for coal. The share of coal also rose in Fiji, and fell markedly in Burma, India, Pakistan and the Republic of Korea. That of hydroelectricity had modest increases in Burma, India, Pakistan, the Philippines and Thailand, and rather larger increases in Nepal and Sri Lanka.

Table 1. World and developing east Asian countries.

Consumption of primary commercial energy, 1950-1978

		Total million tons of coal equivalent	*Percentage from*			
			Solid fuels	*Liquid fuels*	*Natural gas*	*Hydro and nuclear*
World	1950	2 493	62	27	10	1.7
	1960	4 243	52	32	14	2.0
	1970	6 877	35	43	9	2.2
	1973	7 734	32	46	20	2.4
	1978	8 755	32	45	20	2.9
Developing east Asia .	1950	51	71	25	2.1	1.1
	1960	105	61	33	4.2	1.6
	1970	210	43	49	5.2	2.5
	1973	236	36	56	5.0	2.9
	1978	310	32	58	6.6	3.0

Sources: *World Energy Supplies, 1950–1974* (United Nations publication, Sales No. 76.XVII.5), table 2, and *World Energy Supplies, 1973–1978* (United Nations publication, Sales No. E.79.XVII.13), table 4.

Table 2. Selected ESCAP economies. Shares of various types of primary energy in the consumption of commercial energy, 1970 and 1978

(Percentage based on coal equivalents)

	1970				*1978*			
	Coal	*Petroleum*	*Natural gas*	*Hydro and nuclear*	*Coal*	*Petroleum*	*Natural gas*	*Hydro and nuclear*
Afghanistan	28.1	63.6	—	8.1	20.1	67.5	4.3	7.9
Bangladesh	3.0[a]	57.2[a]	38.2[a]	1.7[a]	10.5	50.5	37.1	1.9
Burma	14.8	81.4	0.7	3.1	10.3	73.9	10.9	4.8
Fiji	—	100.0	—	—	4.2	95.8	—	—
Hong Kong	0.7	99.3	—	—	0.2	99.8	—	—
India	73.7	22.1	0.7	3.6	65.6	28.2	1.6	4.6
Indonesia	1.3	67.4	30.1	1.1	0.6	84.4	14.3	0.7
Iran	1.9	48.2	49.2	0.8	1.6	53.5	44.1	0.8
Malaysia	0.5	96.0	—	3.5	0.4	88.1	10.1	1.4
Nepal	0.6	90.2	—	3.7	6.2	80.7	—	13.0
Pakistan	11.8	48.5	36.5	3.2	6.3	39.9	48.6	5.1
Papua New Guinea	—	95.1	—	4.9	—	98.2	—	1.8
Philippines	0.5	97.0	—	2.4	1.8	94.1	—	4.1
Republic of Korea	47.0	52.4	—	0.6	37.8	61.0	—	1.1
Singapore	—	100.0	—	—	0.2	99.8	—	—
Sri Lanka	1.3	94.0	—	4.7	0.2	90.3	—	9.5
Thailand	4.6	96.0	—	2.4	1.4	94.7	—	3.9

Source: *World Energy Supplies, 1970–1973, op. cit.*, table 2, and *1973–1978, op. cit.*, table 4, and country information for Papua New Guinea.

Note: [a] 1972.

31. The rise of crude petroleum to its position as the major primary source of commercial energy has been associated with increasing differentiation of its products and with important innovations which could use them. At first the main products of the petroleum industry were lubricants and kerosene, which appeared just as supplies of whale oil were diminishing for the manufacture of candles and before coal, gas and electric power came to provide rival illuminants. It was soon competing with them in respect of domestic heating and cooking, and was especially successful in rural areas, as it still is in most of Asia. The next major use was as a fuel oil for ships, trains or stationary engines, where it had important advantages over coal in thermal efficiency, saving of storage space, cleanliness and lower handling costs. From transportation the use of fuel oil extended to industry and electricity generation. More dramatic, perhaps, was the advent of the internal combustion engine fuelled by the new distillate, gasolene. Motor transport grew rapidly and the use of gasolene even more rapidly because it came to serve also tractors, other farm equipment and aviation. Diesel oils came after 1930, following the development of an efficient fuel injection system for diesel engines and an enormous demand grew for them to fuel trucks, buses and a whole range of stationary and automotive equipment in building, construction and manufacturing. Further demands came with the development of central heating and air-conditioning for homes and commercial buildings.

32. It has become clear that this trend towards the use of petroleum or natural gas cannot continue. The trend had been helped by falling real prices for crude petroleum; between 1953 and 1970 the money price of Saudi Arabian crude had fallen by nearly 7 per cent while the export price index for industrial countries had risen by 22 per cent. After 1970 petroleum became dearer; its money price rose by 82 per cent up to 1973, twice the percentage increase in the export price of manufacturing countries. In 1974, the money price of Saudi Arabian crude jumped, because of action by the Organization of Petroleum Exporting Countries (OPEC), by 252 per cent so that its real price became 2.5 times the 1953 level. From being an increasingly cheaper commodity, therefore, petroleum became a very dear one.

33. More fundamental, the world has had to recognize that petroleum is a quite finite natural resource. Ultimately recoverable reserves have been

put at 1,900 billion barrels and proven reserves at 640 billion barrels;[13] at the 1979 output of 23 billion barrels, therefore, proven reserves might not last for more than another three decades. The world, accordingly, is faced with a new energy transition — from petroleum to alternative sources of primary energy.

34. This transition must involve considerable strains because alternative sources of energy cannot be quickly or cheaply developed. The World Bank has forecast that developing countries which are net importers of oil can reduce their dependence on crude petroleum and natural gas, between 1980 and 1990, only from 63 to 61 per cent of total consumption of primary commercial energy.[14] Yet coal would not fill the gap because its share is forecast to fall more rapidly from 20 to 15 per cent. That of hydroelectricity would rise from 12 to 14 per cent but the biggest, if still moderate, expansion is expected to come from nuclear and other "non-conventional" sources of primary energy the share of which would rise from 4 to 9 per cent. These "non-conventional" sources include, besides the biomass fuels mentioned at the end of the preceding section, new transformation of energy derived from the sun, the winds, geothermal sources, the tides or thermal differences in the layers of an ocean. Most of these new sources are still in the experimental stage or else have not yet progressed beyond micro-applications, as in the case of photovoltaic generators which provide electric power to navigation beacons or to telecommunication repeater stations in remote locations. In Papua New Guinea, however, a diesel generator in West Sepik has been replaced by a solar one of 10 kilowatts.

35. This scenario is, of course, speculative although it takes account of major possibilities and constraints. It nevertheless indicates the next phase of transition in development and the use of primary energy and the double task that developing ESCAP countries have to face during it. On the one hand, they have to make good use of what supplies of energy, imported and indigenous, become available to them; on the other hand, they have to ensure, as best they can, that alternative sources of primary energy are developed to lessen their present dependence on crude petroleum or natural gas. These considerations apply with most force to countries which are net importers of petroleum, but they also apply to those which are net exporters because they will have to find other sources of export income as petroleum deposits become exhausted.

36. The next section of this chapter looks at recent demand conditions for energy in developing ESCAP countries, and the following one at their supply conditions and possibilities. Such a survey should help to indicate more precisely the general energy situation of the developing ESCAP region and the particular problems of its member countries in regard to energy.

C. PRESENT DEMANDS FOR ENERGY

37. Demands for commercial energy grew rapidly in the developing ESCAP region during the 1960s and, although more slowly, during the 1970s. The energy survey commissioned by ADB, covering all its developing member except India, indicates that their average annual growth rate was 10.2 per cent between 1960 and 1970 and 6.7 per cent between 1970 and 1978.[15] Rates, of course, varied considerably between countries. In 1960-1970 they ranged from 2.8 per cent for Burma to 15.6 per cent for Thailand and 16.9 per cent for Singapore; in 1970-1978 they ranged from 3.0 per cent for Bangladesh and Burma to 13.8 per cent for Indonesia and 12.8 per cent for Papua New Guinea.

38. Over-all demand for commercial energy depends to a large extent upon real GDP but there are other important influences besides income. These include changes in the structure of the economy because different industries have different requirements of energy, the degree of urbanization because this affects household demands for energy, and the realization of economies in the production, transmission or use of secondary forms of energy. Over-all demand also depends on the availability of different sources of primary energy and forms of secondary energy, and particular demands for these are influenced by their relative prices. It is not surprising, therefore, that ratios of growth rates for energy consumption and GDP vary between countries and over time. During the 1960s they ranged from 0.93 for Burma to 2.04 for the Philippines and 2.06 for Singapore, and during the 1970s from 0.35 for Fiji to 2.53 for Papua New Guinea. From 1960-1970 to 1970-1978, the rate fell from 1.75 to 0.79 for Malaysia, and from 1.77 to 0.87 for the Republic of Korea.[16]

39. China's large economic size and importance as a producer and refiner of petroleum make centrally planned Asia almost self-sufficient in regard to crude oil and its energy derivatives. However, these liquid fuels and natural gas, in 1978, accounted for about a fourth[17] of commercial energy usage, the net

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[13] World Bank, *op. cit.*, pp. 13–14.

[14] *Ibid.*, p. 49.

[15] Coopers and Lybrand Associates, Limited, *op. cit.*, vol 1, table 1.1.

[16] *Ibid.*, tables 1.1 and 1.2.

[17] Recent official estimate.

export of crude was less than a tenth of its production and exports of refined energy products did little more than balance their imports.

40. In the rest of the developing ESCAP region liquid fuels and natural gas accounted for 65 per cent of commercial energy usage and in the Pacific island countries for as much as 95 per cent. Net imports came to 20 per cent of the use of crude oil and to 5 per cent of the consumption of energy products derived from crude or natural gas. These are over-all figures and there are those which have to rely wholly upon imports for its supply. Other differences arise between countries which are large net exporters of refined products and those which are large net importers of these products because they lack refining capacity. Import dependence on petroleum, moreover, is by no means limited to its energy products. Other derivatives include lubricants, bitumen and those which are used to produce nitrogenous fertilizers, insecticides, synthetic rubber and fibres, plastics, adhesives, aerosols, explosives or a range of pharmaceuticals. Some of these also result from the processing of natural gas, coal or biogas.

41. The direct demand for crude petroleum obviously depends on refinery capacity to meet domestic needs for petroleum products plus any export opportunities in respect of them. Table 3 throws light upon the position of some Asian countries in this regard.

42. As would be expected, there is a match between supplies of crude and capacity to refine it although by no means a perfect one. Excess capacity is relatively marked for India, Iran, Malaysia, the Philippines and Singapore, presumably because refineries have been built in anticipation of strong growth in demands for petroleum products. Excess supply is also marked for Indonesia, helping, perhaps, to offset Singapore's marked excess capacity of 86 per cent over its supply of crude oil. Of the 15 economies in the table, China, India, Indonesia, Iran, the Republic of Korea and Singapore, have almost nine tenths of the total refinery capacity. Processing imported crude in order to export refined products has become a major industry in Singapore.

43. The refined products which are secondary sources of energy are the light distillate, gasolene

Table 3. Selected ESCAP economies. Production, trade and apparent supply of crude petroleum, 1978

(Million metric tons)

	Production	*Imports*	*Exports*	*Apparent supply*[a]	*Refinery capacity*	*Percentage of total supply*[b]	*Percentage of total capacity*[b]
Afghanistan	0.008	—	—	—	—	—	—
Bangladesh	—	1.200	—	1.200	1.680	0.4	0.6
Brunei	10.320	—	10.000	0.080	0.121	—	—
Burma	1.461	—	—	1.461	1.320	0.5	0.5
China	104.050	—	9.000	95.050	82.000	35.5	28.3
India	11.188	14.400	—	25.488	32.000	9.5	11.0
Indonesia	90.010	3.000	60.000	33.000	25.100	12.3	8.7
Iran	261.000	—	226.000	35.000	40.260	13.1	13.9
Malaysia	9.685	4.100	8.950	4.835	8.450	1.8	2.9
Pakistan	0.480	3.000	—	3.480	3.700	1.3	1.3
Philippines	—	9.920	—	9.920	13.570	3.7	4.7
Republic of Korea . . .	—	24.500	—	23.625	25.185	8.8	8.7
Singapore	—	24.836	0.181	24.655	45.950	9.2	15.9
Sri Lanka	—	1.550	—	1.465	1.850	0.7	0.6
Thailand	0.008	8.310	—	8.318	8.500	3.1	2.9

Source: *World Energy Supplies, 1973–1978, op. cit.*, table 10.

Notes: [a] Supply is production plus imports minus exports minus additions to stocks (not shown here).

[b] Total of countries listed.

used mainly for small transport motors, kerosene used mainly in Asia for domestic lighting and cooking (especially in rural areas), aviation turbine and jet fuel, diesel oil used mainly for larger transport or stationary engines and for heating, and the heavy distillate, furnace oil, used mainly by ships and large-scale heating installations such as furnaces or boilers. Table 4 shows the production and net trade of the main energy products in the developing ESCAP region.

44. In volume terms, the largest share of the production or consumption of energy petroleum products goes to fuel oils, the middle distillate diesel fuel used for internal combustion engines and furnaces and residual fuel oils used for marine engines and large-scale heating installations. This share, however, varies with transport needs and the degree of industrial development. It is 85-90 per cent in Hong Kong, the Republic of Korea and Singapore, but less than 50 per cent in Afghanistan, Brunei and Nepal. In Bangladesh, Burma, Indonesia, Iran and Pakistan it is 59-67 per cent, in India, the Philippines, Sri Lanka and Thailand, 70-74 per cent, and in Malaysia a high 83 per cent.

45. There are also wide variations in the consumption shares of kerosene, related to a considerable extent to the degree of electrification. In Malaysia, the Philippines, the Republic of Korea and Thailand, the share is only 5 to 10 per cent, but rather surprisingly, 12-13 per cent in Hong Kong and Singapore. At the other extreme, it is 31 per cent in Bangladesh and Nepal, and 20 to 25 per cent in Afghanistan, India, Indonesia, Iran, Pakistan and Sri Lanka.

46. Gasolene's share in the total consumption of petroleum energy products also varies widely. In heavily urban Hong Kong and Singapore, it is less than 3 per cent. In Afghanistan, Burma and Nepal it is as high as 25 to 33 per cent, but only 7 to 8 per cent in India and Sri Lanka. It is 12 to 17 per cent in Iran, Pakistan, the Philippines and Thailand. These differences would seem to be related more to size of area, density of population, degree of urbanization and the importance of rail transport than to average income and the demands of tourism.

47. Yet there is no exact match between the consumption of petroleum products and refinery outputs. A refinery is designed to produce a more or less specific range of distillates in more or less specific capacity proportions which cannot be easily or cheaply altered. Thus India refines almost all of the gasolene which it uses but has to import some kerosene and diesel oils. Burma and the Republic

Table 4. Selected ESCAP economies. Production and net imports of major energy products of petroleum, 1978

(Thousand metric tons)

	Gasolene		*Kerosene*[a]		*Fuel oils*[b]		*Liquid petroleum gas*	
	Production	*Net import*	*Production*	*Net import*	*Production*	*Net import*	*Production*	*Net import*
Afghanistan	—	122	—	73	—	172	—	—
Bangladesh	55	8	345	25	685	80	—	—
Brunei	25	13	—	17	32	—	15	—
Burma	247	—	147	—	584	—	4	—
China	...	−135	...	−325	...	−820	...	...
Hong Kong	—	150	—	845	—	5 269	—	94
India	1 521	20	3 450	885	13 989	1 415	400	—
Indonesia	2 458	125	4 805	812	13 900	620	45	−1
Iran	5 470	−2 375	5 800	−300	23 500	−6 050	1 570	−1 200
Malaysia	430	140	275	98	3 825	855	15	—
Nepal	—	19	—	23	—	33	—	—
Pakistan	480	55	800	90	1 740	410	5	—
Philippines	1 800	−57	690	−15	6 750	749	150	25
Republic of Korea	935	−75	1 653	30	17 465	240	280	−75
Singapore	900	−640	3 495	−2 178	16 600	−7 411	155	−145
Sri Lanka	103	3	265	45	927	50	5	—
Thailand	1 380	56	875	25	5 225	1 510	125	2

Source: *World Energy Supplies, 1973–1978, op. cit.*, tables 15–18.

Notes: [a] Includes jet fuels.

[b] No separate figures are provided for distillate and residual fuel oils, although that would be desirable.

of Korea are the only countries which have a close match of petroleum products with domestic demands for them, although Singapore is more than self-sufficient in this respect. In general, there is a deficiency of middle distillate fuel oils which has had to be met by imports; the proportion of net imports in the domestic supply of fuel oils is about one fifth in Malaysia, Pakistan and Thailand, about one tenth in India and the Philippines, and half that in Indonesia and Sri Lanka. Most of these countries have also had to import a substantial part of their kerosene and aviation fuels, the proportion ranging from 10 to 26 per cent for India, Indonesia, Malaysia, Pakistan and Sri Lanka. Malaysia has also had to import one quarter of the gasolene which it uses, and Bangladesh and Pakistan about one eighth.

48. Data regarding final consumption of energy petroleum products and other forms of energy are available, by economic sectors, for only eight developing ESCAP countries, five of which are in south Asia. Table 5 summarizes these data. It shows that around half of energy petroleum products go directly to transport, the proportion ranging from 23 per cent in Bangladesh to 56 per cent in Sri Lanka and, exceptionally, to 79 per cent in Papua New Guinea where the large Bougainville copper mine accounts for a third of all petroleum used. It ranges from 38 to 52 per cent in India, Indonesia, Nepal, Pakistan and Thailand. Direct industrial use of energy petroleum products is 20-28 per cent in Bangladesh, India, Indonesia, Sri Lanka and Thailand, 17 per cent in Papua New Guinea and only 8 per cent in Pakistan. Natural gas provides directly seven times as much industrial power for Pakistan as do petroleum products, and it also makes a useful contribution to industrial power in Indonesia. Little use has been recorded for energy petroleum products in the agricultural sector of any of these countries so that the remainder of them go to commercial, government and household uses — or to the generation of thermal electricity.

49. The proportion of electricity in final consumption of energy is 10-26 per cent in Bangladesh, Pakistan and Thailand, 6-8 per cent in India, Nepal and Sri Lanka, only 2 per cent in Indonesia but 18 per cent in Papua New Guinea, again because of its large copper mine. Nepal and Sri Lanka generate most of their electricity at hydrostations, and Pakistan generates four fifths of its electricity by using natural gas. Coal-rich India uses only 9 per cent of its supply of petroleum products to generate electricity and Indonesia, where electricity provides only 2 per cent of commercial energy, less than at 10 per cent. For Thailand the same proportion is 20 per cent, and for Papua New Guinea it is nearly 38 per cent.

50. Electricity has many advantages as a convenient and versatile type of power which can be generated by means of a wide variety of fuels — wood, coal, petroleum, nuclear fuels and biogas — as well as hydro, geothermal or ocean thermal sources. But it has two disadvantages, a minor loss of input energy in generation, ranging from 1 per cent for hydro-plants to 6 per cent for coal-fired plants, and a major transmission and distribution loss of 11 to 14 per cent or more; this transmission loss increases with the distance over which electricity is transmitted and decreases as the transmission voltage rises. Investment costs are also high, and they vary with the type of production. For large oil- or gas-fired plants the investment cost per installed kW is, according to the World Bank currently about $US 800, for large coal plants about $US 1,000, for large hydro-plants about $US 1,100, and for large nuclear plants perhaps $US 1,600; and these costs seem too low for Asian countries. For smaller plants, thermal or hydro, the unit investment cost can rise sharply. In addition to the investment cost of generation there are substantial costs of erecting transmission lines and sub-stations, and they depend on the distance covered together with the density of users.

51. Nevertheless the development of electricity by other means than burning fuel oils offers one of the more promising long-term prospects for petroleum-deficient countries to improve their energy situations and balances of payments. World Bank estimates put the present percentage of commercial energy which is transformed into electricity at 25 per cent for all developing countries and projects a rise in this percentage to 31 per cent by 1990.[18] It also points to the substantial possibilities of reducing transmission losses by improving or rehabilitating transmission and distribution networks.

52. Coal is an important source of power only in India among the countries listed in table 5. It accounts for nearly two thirds of total commercial energy in India, one third in Nepal, which makes relatively small use of commercial energy, for 8 per cent in Bangladesh and Pakistan, and for 1 per cent or less in the other three countries. Its main use in India is for industrial purposes and there, electric power plants and railways are also major consumers of coal.

D. SUPPLIES OF ENERGY

53. In a very broad sense the developing ESCAP region has been about self-sufficient in regard to energy. The 17 economies listed in table 6 had, in 1978, an aggregate output of coal nearly equal to their aggregate use of it for energy purposes.

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[18] World Bank, *op. cit.*, table 27, p. 63.

Table 5. Selected developing ESCAP economies.

Sectoral final use of commercial energy, c. 1975

(Thousand tons of oil equivalent)

	Coal	*Petroleum*	*Natural gas*	*Electricity*	*Total*
Bangladesh 1973/74					
Agriculture	—	34	—	3	37
Industry	94	259	172	312	837
Transport	39	205	—	—	244
Commerce etc.	2	409	7	105	523
Households	—	—	—	—	—
Total	135	907	179	420	1 641
India 1975					
Agriculture	—	1 695	—	720	2 415
Industry	30 826	3 993	—	3 691	38 510
Transport	8 217	8 008	—	162	16 387
Commerce etc.	6 383	3 018	116	998	10 515
Households	—	—	—	—	—
Total	45 426	16 714	116	5 571	67 827
Indonesia 1976					
Agriculture	—	—	—	—	—
Industry	49	3 354	1 015	83	4 501
Transport	30	4 713	—	—	4 743
Commerce etc.	—	4 160	34	180	4 374
Households	—	—	—	—	—
Total	79	12 227	1 049	263	13 618
Nepal 1974/75					
Agriculture	—	—	—	—	—
Industry	36	7	—	2	45
Transport	3	41	—	—	44
Commerce etc.	6	3	—	1	10
Households	—	29	—	5	34
Total	45	80	—	8	133
Pakistan 1973/74					
Agriculture	—	258	—	97	355
Industry	558	230	1 605	267	2 660
Transport	—	1 365	—	—	1 365
Commerce etc.	—	1 109	175	186	1 470
Households	—	—	—	—	—
Total	558	2 962	1 780	550	5 850
Papua New Guinea					
Agriculture	—	—	—	—	—
Industry	—	60	—	64	124
Transport	—	278	—	—	278
Commerce etc.	—	1	—	6	7
Households	—	13	—	9	22
Total	—	352	—	79	431
Sri Lanka 1975					
Agriculture	—	—	—	—	—
Industry	3	159	—	51	213
Transport	5	439	—	—	444
Commerce etc.	—	187	—	14	201
Households	—	—	—	—	—
Total	8	785	—	65	858
Thailand 1977					
Agriculture	3	1 061	—	1	1 065
Industry	104	1 883	—	549	2 536
Transport	—	4 022	—	—	4 022
Commerce etc.	—	792	—	306	1 098
Households	—	—	—	—	—
Total	107	7 758	—	856	8 721

Sources: Cooper and Lybrand Associates, Limited, *op. cit.*, vol. 1, tables 1.13 and 1.15–1.20; Ashok V. Desai, *Inter-fuel Substitution in the Indian Economy, op. cit.*, table II.4; Ken Newcombe and others, *Energy for Development: the Energy Policy Papers of the Lae Project* (Canberra, Centre for Resource and Environmental Studies, for UNESCO, 1980), table 10.

Table 6. Selected ESCAP economies. Production, consumption and net trade in commercial energy, 1978

	Solid fuels[a]			Crude petroleum[b]				Natural gas[c]			Energy petroleum products[b]		
	Production	Consumption	Balance	Production	Consumption	Balance	Refining capacity	Production	Consumption	Balance	Production	Consumption	Balance
Afghanistan	0.170	0.170	—	—	—	—	—	23.905	0.225	+23.650	—	0.367	−0.367
Bangladesh	—	0.378	−0.378	—	1.200	−1.200	1.680	9.350	9.350	—	1.085	1.186	−0.101
Brunei	—	—	—	10.220	0.080	+10.140	0.121	86.835	13.835	+73.000	0.072	0.102	−0.030
Burma	0.013	0.214	−0.201	1.460	1.460	—	1.320	1.570	1.570	—	0.982	0.982	—
China	618.000	616.170	+1.830	104.050	95.050	+9.000	82.000	45.900	45.900	—	89.610	88.330	+1.280
Hong Kong	—	0.017	−0.017								—	5.042	−5.042
India	73.183	74.501	−1.318	11.188	25.488	−14.300	32.000	12.387	12.387	—	19.379	20.994	−1.615
Indonesia	0.270	0.263	+0.007	90.000	33.000	+57.000	25.100	53.184	40.984	+12.200	21.284	22.434	−1.150
Iran	0.900	1.000	−0.100	261.000	35.000	−226.000	40.260	276.592	196.592	+80.000	36.340	22.110	+14.230
Malaysia	—	0.042	−0.042	9.685	4.835	+4.850	8.450	0.870	6.670	−5.800	4.545	5.495	−0.950
Nepal	—	0.009	−0.009								—	0.075	−0.075
Pakistan	0.784	0.828	−0.044	0.480	3.480	−3.000	3.700	45.000	45.000	—	3.025	3.427	−0.402
Philippines	0.240	0.290	−0.050	—	9.920	−9.920	13.570				9.421	9.675	−0.254
Republic of Korea	17.760	19.039	−1.279	—	23.625	−23.625	25.185				20.333	20.888	+0.045
Singapore	—	0.009	−0.009	—	24.656	−24.656	45.950				21.150	3.735	+17.415
Sri Lanka	—	0.003	−0.003	—	1.465	−1.465	1.850				1.300	0.951	+0.349
Thailand	0.177	0.205	−0.028	0.008	8.318	−8.310	8.500				7.605	9.133	−1.528
Developing Oceania	—	0.112	−0.112	—	1.500	−1.500	2.016				1.421	2.303	−0.882

Source: *World Energy Supplies, 1973–1978, op. cit.*, tables 7, 10, 14 and 19.

Notes: [a] Million metric tons of coal equivalent.

[b] Million metric tons.

[c] Thousand tetracalories.

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Even if Iran is left out of account, their aggregate output of crude petroleum was 10 per cent less than their aggregate use of it, and they had a surplus of natural gas equal to more than a third of their aggregate output. There is little trade in the other indigenous sources of primary energy, firewood and hydroelectric power. Nor was there much aggregate disparity between use of crude petroleum and refining capacity; production of energy petroleum products was 9 per cent above their aggregate consumption.

54. These facts may be suggestive in regard to possibilities of regional co-operation over energy, but they obscure wide differences in the position of individual countries. There are only two large coal producers, China and India, both of which use almost all that they produce to make coal easily their major source of primary energy. The Republic of Korea also has substantial coal deposits, and uses them for a third of its primary energy, as compared with corresponding ratios of two thirds in India and seven tenths in China.[19]

55. China is also, next to Iran, the largest producer of crude oil in the region, but uses domestically over 90 per cent of its present output so that it has a net export surplus much below that of Indonesia, the third largest regional producer of crude oil. Both Brunei and Malaysia have an output equal to about one ninth of Indonesia's; almost all of Brunei's output is exported but only half of Malaysia's to give it 9 per cent of Indonesia's net export of crude. Burma was formerly a significant exporter of crude oil but now produces less than 2 per cent of the Indonesian output and has a negligible export of crude. India, like Malaysia, has recently emerged as a substantial producer of oil but still imports much more than it produces.

56. Iran has over half the total output of natural gas and Brunei a sixth of it. Indonesia and Pakistan each produces about three fifths of Brunei's output and China about half of it. Afghanistan and Bangladesh are smaller but significant producers of natural gas. Only Brunei, Afghanistan and Indonesia are net exporters of natural gas, Brunei having two thirds of their combined export, Afghanistan a fifth and Indonesia a tenth. However, natural gas is a very minor contributor to supplies of primary energy, yielding less than 1 per cent of it in the developing ESCAP region.

57. It is hardly surprising, in view of its vast size, that China has recently refined nearly two fifths the region's total output of energy petroleum products although its export surplus is only 1.5 per cent of its own output. The only other countries in the region with a substantial net export of refined products are Singapore, the net export surplus of which is more than 13 times that of China, and Iran, the net export of which, in 1978, was a fifth less than that of Singapore. The Republic of Korea and Sri Lanka have comparatively small net export surpluses of refined products, quite marginal for the Republic of Korea but equal to one quarter of output for Sri Lanka. Bangladesh, Burma, India, Indonesia and the Philippines refine more than 90 per cent of the petroleum products used domestically and Pakistan nearly that proportion. Malaysia and Thailand have a corresponding proportion of 83 per cent, developing Oceania as a whole one of 62 per cent (only because of Guam's refineries) and Brunei one of 58 per cent. Afghanistan, Hong Kong and Nepal are wholly dependent on imports for refined petroleum.

58. There is very heavy dependence on west Asian oil producers for imports of crude petroleum arising from the fact that their crude is better-suited to the production of middle distillates — kerosene, dieselene and fuel oils, all in strong demand — than is Indonesian crude. This is better suited to the production of gasolene and so finds its major markets in Japan and North America. The same holds true for Brunei's crude. Nevertheless, Singapore obtains 23 per cent of its import of crude from one or other of these two Asian producers, the Philippines 18 per cent, Thailand 14 per cent and Malaysia 7 per cent.[20] India obtains 12 per cent of its crude from the USSR or East European sources. The Republic of Korea and Pakistan obtain all their imports of crude from west Asia, Malaysia and Sri Lanka more than 90 per cent, India and Thailand more than 80 per cent, and the Philippines and Singapore more than 75 per cent.

59. It is not possible to give similar figures for refined petroleum products, but UNCTAD[21] has made a global estimate for south and south-east Asia in regard to sources of combined imports of crude and refined products measured in value terms. They indicate that, in 1976, OPEC countries supplied 79 per cent of the combined import and south-east Asian countries 16 per cent. The USSR and East European countries supplied (mainly to India) 3 per cent. Although, then, west Asia is not the only supplier of imports of refined products within the region, its net export of them (i.e. exports plus bunker deliveries less imports) was equal to 62 per cent of all corresponding net imports by the oil-importing economies listed in table 6.

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[19] Recent official estimate.

[20] These estimates are for 1977 and are obtained from *World Energy Supplies, 1973–1978, op. cit.*, table 11.

[21] UNCTAD, *Handbook of International Trade and Development Statistics*, 1979, table A5.

60. Short-term supplies of petroleum to developing ESCAP countries depend on the current world output, current additions to proven reserves and the competition of other regions for the available output. In 1979 the world produced 3,106 million tons of crude petroleum and additions to proven reserves just balanced that depletion. Reserves, however, have been decreasing in the Middle East so that producers there are seriously considering reducing their outputs so as to conserve their major but diminishing asset. The short-term outlook for supplies of crude petroleum, therefore, is not at all favourable and the World Bank expects that by 1985 demand for it will outstrip supply.[22] It has also to be noted, in regard to energy supply, that about a tenth of refinery outputs consist of non-energy products; bitumen for surfacing roads, naphthas for a wide range of petrochemicals and lubricants. For developing countries the most important petrochemical is nitrogenous fertilizer, vital to the further progress of the "green revolution" in raising yields of cereals; but synthetic fibres for textiles and plastics for a wide range of uses are also important.

61. In 1978 the developing ESCAP region obtained only 5 per cent of the world supply of crude petroleum although it has half the world's population. Its demand is thus somewhat marginal in relation to the world demand and its comparative poverty puts it at a disadvantage in competing for scarcer petroleum with the industrial nations, which take about 55 per cent of the world supply. An urgent problem, therefore, is to ensure adequacy and security of petroleum supplies to developing ESCAP countries in the next years of increasingly scarce petroleum.

62. Something has also to be said about the longer-term question of potential supplies of major forms of energy in developing ESCAP countries. The World Bank has made some estimates for coal, petroleum, natural gas and hydroelectricity which are summarized in table 7.

63. China and India have very large reserves of coal, far in excess of their current rates of extraction, although India's coal is generally of inferior quality. An official committee has recommended efforts to double the Indian output by 1988, efforts which include greater mechanization and better transport facilities. If the target were to be met, the extra output of 100 million tons would be equivalent to about half that quantity of petroleum or about double India's 1978 consumption of petroleum. Bangladesh, the Republic of Korea and Thailand are the only other developing ESCAP countries to have significant coal reserves but those of Bangladesh are small in relation to its energy needs, supplying less than 2 per cent of them. In the Republic of Korea coal has recently supplied nearly a third of energy consumed and its output has been increasing at a rate not much below that of energy consumed as a whole. Its reserves could last for another 20 years at the current rate of extraction and the Korea Energy Research Institute expects this rate to increase by less than 5 per cent a year up to 1986 as against 7.1 per cent in 1979-1983. Thailand's coal is mainly lignite which has only a third of the calorific value of anthracite or bituminous coal. Reserves are far in excess of current usage, which meets less than 3 per cent of the country's energy needs. The National Energy Administration has thought it feasible to raise this proportion to nearly 17 per cent up to 1980 by achieving a 22-fold increase of output.

64. China, which has next to Iran, much the largest reserves of oil, as well as the largest reserves of coal and perhaps the greatest hydro-potential in the ESCAP region, is seeking to reduce petroleum exports because outputs from existing fields are diminishing. Indonesia, however, with the third largest oil reserves in the region, is seeking to increase them. It has become heavily dependent on oil exports which, in 1978, accounted for nearly two thirds of export receipts but, after reaching a peak in 1977, their quantity has declined both absolutely and as a proportion of their output. Measures are thus being taken to step up exploration for oil and to economize on its domestic uses, again by developing neglected resources of coal and hydroelectricity.

65. Malaysia, which has the next largest proven reserves of petroleum to Indonesia, and even larger reserves of natural gas, had increased the quantity of its crude petroleum and natural gas exports at an average rate of 17 per cent a year between 1973 and 1978. A new National Petroleum Policy, however, envisages a contraction of production from 283,000 barrels a day in 1979 to 260,000 barrels a day by 1981 so as to conserve this depletable resource. At the same time, it is considering setting up a new refinery to process light crude which has been exported mainly to Japan and the United States. Malaysia's net export of crude petroleum, equal to 50 per cent of its output in 1978, may thus decline in spite of measures to economize on the domestic consumption of petroleum. Brunei's exports of crude petroleum have been stationary at around 10 million tons since 1976 although it has the potential for considerable expansion over the next decade at least.

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[22] *World Development Report, 1979* (Washington D.C., World Bank 1980), p. 35.

Table 7. Developing ESCAP economies. Reserves of commercial sources of energy

	Coal[a]	*Oil*[b]	*Gas*[b]	*Hydro*[c]	*Ratio of reserves to 1978 production*			*Hydro*[d] *ratio*
	(million tons of oil equivalent)			*(gigawatts)*	*Coal*	*Oil*	*Gas*	
Afghanistan				6.0				25
Bangladesh	346	3	228	1.3			250	12
Brunei		245	178			24	21	
Burma		3	3	75.0		2	20	380
China	65 922[e]	2 720[e]	611		157	26	137	
Fiji				0.4				
Hong Kong								
India	22 467	218	196	70.0	450	20	163	7
Indonesia	953	1 306	525	30.0	5 179	15	102	55
Iran	50	7 888	11 322	10.2	82	30	421	12
Malaysia		381	571	1.3		39	6 718	4
Nepal				80.0				2 162
Pakistan		27	364	20.0		56	83	23
Papua New Guinea				17.8				195
Philippines		3		7.5				6
Republic of Korea	257			5.5	21			8
Samoa				0.015				15
Singapore								
Sri Lanka				1.2				4
Thailand			185	6.2				7

Sources: World Bank, *Energy in the Developing Countries* (Washington D.C., 1980), tables II.1, II.4 and II.5; United Nations, *World Energy Supplies, 1973–1978,* tables 5 and 22.

Notes: [a] Technically and economically recoverable under present conditions.

[b] Proven reserves.

[c] Includes all installed and installable capacity, assuming average flows of water.

[d] Ratio of installed plus installable capacity to installed capacity.

[e] A more recent official estimate puts China's reserves of coal at 64 500 million tons. The estimate of oil reserves is regarded as unduly low.

66. The hydroelectric potential of the region is vast, especially in China, Nepal, India, Indonesia, Pakistan, Papua New Guinea and Viet Nam, and not inconsiderable in Afghanistan, the Republic of Korea, the Philippines and Thailand. China is thought to have tapped less than 3 per cent of its potential and is planning a 25 per cent increase in its current output of hydroelectricity. Nepal, too, has hardly begun to tap its hydro-potential but four large projects are now under way which should add 4,760 megawatts, nearly a 100-fold increase of the present output. In Papua New Guinea hydroelectricity provides a fifth of all commercial energy but could provide much more. A hydropower resource inventory and development plan is now being prepared in conjunction with a national energy model but, in the near future, increasing demands for electricity will have to be met by thermal plants.

67. In India hydropower already furnishes more than two fifths of the country's electricity and its further development has become the top priority in this area. Indonesia, which has tapped only 2 per cent of its hydro-potential, has three major projects under construction and they should increase the output of hydroelectricity by one half. Like India, Pakistan has derived about half of its electric power from hydrostations and, when the new Tarbela project is completed in 1984, nearly a third will be added to total generating capacity; other hydro-projects are also being considered.

II. IMPACTS OF HIGHER OIL PRICES

68. After 1970 the price of crude petroleum rose in both money and real terms. The money price of Saudi Arabian crude rose at an average rate of 11.3 per cent a year between 1970 and 1973 and the export price index for industrial countries at the slower rate of 6.7 per cent a year. That was only a prelude to the dramatic rises in oil prices in 1973 and 1974; the money price of Saudi Arabian crude rose by 34 per cent in 1973 and, following effective OPEC action, by 252 per cent in 1974. Over the three years 1973-1975, therefore, it had risen at an average rate of 95 per cent a year as compared with corresponding rates of 25 per cent for export prices of industrial countries and of 23 per cent for export prices of oil-importing countries in the developing ESCAP region.

69. In this chapter some of the consequences of this jump in oil prices are examined in relation to the region. It begins by considering effects on inflation and goes on to discuss effects on foreign trade, balances of payments and real outputs of major economic sectors.

A. IMPACT ON INFLATION

70. Table 8 shows that inflation, as measured by the annual rate of change in the index of consumer prices, was comparatively moderate in the developing ESCAP region both before and after the 1973-1974 jump in oil prices; better, in fact, than in the world as a whole and, after 1974, better also than in the industrial countries. Yet, in the three crucial years, 1973-1975, inflation was considerably worse in the developing ESCAP region than in either the world as a whole or the industrial countries. If, then, the region was comparatively successful in bringing down inflation after 1975 it had a bigger inflationary difficulty to overcome.

71. The table also shows that serious enough inflation was occurring before the jump in oil prices. The causes of this have been attributed to a combination of cost and demand influences — extraordinary wage increases in the industrial countries and a world boom fuelled by large increases of money supplies. These developments are reflected in the very rapid increases of export prices for industrial

Table 8. Annual percentage rates of change in prices, 1970-1979

	Industrial countries: export prices	*Saudi Arabian crude petroleum price*	*Oil-importing developing ESCAP*			*World consumer prices*	*Industrial countries: consumer prices*
			Import prices	*Export prices*	*Consumer prices*		
1970	6.4	0.0	2.0	0.0	5.7	6.0	5.6
1971	5.0	21.7	3.0	—2.0	4.6	5.9	5.1
1972	8.6	12.3	4.9	3.1	6.5	5.8	4.5
1973	23.7	33.7	26.9	38.6	14.9	9.4	7.5
1974	42.6	252.0	56.2	40.0	27.9	15.0	12.6
1975	8.5	—0.4	7.5	—9.7	9.6	13.3	10.7
1976	2.0	7.4	—2.0	3.0	—1.0	11.1	8.3
1977	8.8	7.7	5.1	12.6	8.0	11.4	8.4
1978	9.9	2.4	7.8	9.5	5.8	9.7	7.2
1979	20.5	33.5	17.1	17.3	9.4	12.0	9.1
Average:							
1970–1972 . . .	6.7	11.3	3.3	3.7	5.6	5.9	5.1
1973–1975 . . .	24.9	95.1	30.2	23.0	17.5	12.6	10.3
1976–1978 . . .	6.9	5.8	3.6	8.4	4.3	10.7	8.0

Sources: International Monetary Fund, *International Financial Statistics* (Washington D.C.), various issues.

countries in 1973 and 1974 and also in the corresponding large increases in both the import and export prices of oil-importing countries in the developing ESCAP region. The rise of oil prices after 1970 contributed something to this inflationary process but it could not have been very much because, even in Japan, which depends very largely upon oil imports for energy, petroleum products, in 1970, were less than 2 per cent of GDP.

72. More important, inflation slackened markedly in 1975 and 1976, i.e. just after the large increase of oil prices. During these two years the annual rate of increase of export prices for industrial countries fell from 42.6 to 2.0 per cent, and that of import prices for developing ESCAP countries which are oil importers from 56.2 to –2.0 per cent. There was a corresponding fall in the annual rate of increase of consumer price in these developing countries from 27.9 to –1.0 per cent.

73. What, then, the big jump in oil prices did was not so much to contribute to inflation as to aggravate a world recession. The most important immediate effect of higher oil prices was to cause huge surpluses in the balances of payments of oil-exporting countries and corresponding, if far more diffused, deficits for other countries. Thus the total foreign exchange reserves of oil-exporting countries quadrupled between 1973 and 1975, rising from 7.9 to 24.8 per cent of the world total. The corresponding loss of reserves in oil-importing countries obliged them to adopt deflationary monetary and fiscal policies in attempts to contain their suddenly worsened current balances of payments. Demands for goods and services, accordingly, fell and profit margins were additionally squeezed by the higher real price of oil itself and, in the industrial countries, by continued wage inflation.

74. The consequence was a marked check to world industrial production. This had grown at an average rate of 6.0 per cent between 1968 and 1972 and had reached a peak rate of 8.9 per cent in the boom of 1973. It then fell to 2.5 per cent in 1974 and became negative at –1.6 per cent in 1975; up to 1979, it had recovered only to 4.6 per cent. World exports depend largely upon world industrial production. Their annual growth rate had been 9.0 per cent in 1970-1972, fell to 4.6 per cent in 1974, and also became negative at –3.6 per cent in 1975. All this meant weaker demands for the exports of developing ESCAP countries. Their export price index, after rising by 40.0 per cent in 1974, fell by 9.7 per cent in 1975 and had recovered only by 3.0 per cent in 1976.

75. This shrinkage of world demand could have been offset if oil-exporting countries had been in a position to increase their own imports on a scale commensurate to their gains of foreign exchange. Their imports did more than treble between 1973 and 1976 but not nearly enough to offset a rise of their foreign exchange reserves from SDR 12,041 million to SDR 56,123 million. Most of these countries have too small a population and too limited a resource base to absorb imports on the scale required and, understandably, many were reluctant to undertake an economic transformation which could lead to social tension and political instability. The main offset, therefore, came from "recycling" of funds from the oil-exporters to other countries, a process of investment, lending and extending grant aid which is discussed later.

76. None of this is a denial that developing Asian countries had considerable problems in regard to inflation after 1972. But, by 1975 or 1976, India, Malaysia, Nepal, the Philippines, Singapore, Sri Lanka and Thailand had brought their rates of increase in consumer prices down to the 1972 level. Burma had not, but it is self-sufficient in regard to petroleum. Nor had the Republic of Korea but other factors than the oil prices were responsible for that, factors connected with abnormally large increases of its money supply. Developing Asian countries, like the industrial countries, had some abatement of inflationary pressures from the world recession and also tried to apply restrictive financial policies as indicated by considerable declines, after 1974, in the annual rates of increase of their money supplies. By 1975, India, Malaysia, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka and Thailand had all brought down their rates of increase for money to the 1972 rate or, in most cases, below it.

B. THE TRADE BURDEN

77. There can be no doubt that dearer petroleum meant a heavier real cost, in terms of exports, to the developing ESCAP countries which had depended on imports of this key commodity, or of its products, for one half of all the commercial energy they used in 1970.

78. Table 9 reproduces price indexes for crude petroleum in Indonesia and Saudi Arabia and indexes of "posted" prices for petroleum products in Singapore, these being the nearest approaches to international prices for petroleum products in the region. It also reproduces general indexes of export and import prices for non-oil developing countries in Asia and consequent derivations of their general terms of trade and their specific terms of trade for crude petroleum and for its major energy products.

Table 9. Developing ESCAP economies. Price indexes and terms of trade of crude petroleum and petroleum products, 1970-1979

	Crude petroleum		*Singapore posted prices of*				*Developing Asia unit prices of*	
	Indonesia	*Saudi Arabia*	*Gasolene*	*Kerosene*	*Diesel*	*Other fuel oil*	*Exports*	*Imports*
A. *Price indexes* (1975=100)								
1970	13	16	22	28	23	25	59	45
1971	17	19	26	32	28	30	61	47
1972	22	21	27	32	29	25	66	49
1973	46	28	36	38	34	33	81	62
1974	92	100	93	103	96	96	95	95
1975	100	100	100	100	100	100	100	100
1976	101	107	121	110	114	104	103	98
1977	107	107	116	114	119	118	116	103
1978	107	110	118	118	124	117	127	111
1979	143	150	184	186	196	209	149	130
B. *Terms of trade*[a] (1975=100)								
							General	
1970	453	369	268	210	257	235	131	
1971	359	321	235	191	218	203	130	
1972	333	318	244	206	228	264	135	
1973	176	346	225	213	238	245	131	
1974	103	95	102	92	99	99	100	
1975	100	100	100	100	100	100	100	
1976	102	96	85	94	90	99	105	
1977	108	108	100	102	97	98	113	
1978	119	109	85	85	102	109	114	
1979	104	99	81	80	76	71	115	
Average 1970–1973	330	339	243	205	235	237	132	
Average 1974–1978	106	101	92	92	94	96	111	

Sources: Coopers and Lybrand Associates, Limited, *op. cit.*, vol. 1, table 1.29; United Nations, *Monthly Bulletin of Statistics*; International Monetary Fund, *International Financial Statistics.*

Note: [a] Export price index of developing Asia divided by the relevant petroleum price index.

79. The general terms of trade are, of course, the ratio of export to import prices and hence an inverse index of the real unit cost of imports in terms of exports. The specific terms of trade for crude petroleum or any one of its products are ratios of export prices to the price of petroleum or of that product and so an inverse index of their unit real costs in terms of exports.

80. It may be noticed, first, that OPEC prices of crude petroleum did not rise uniformly; when the price of Saudi Arabian crude was raised by 252 per cent in 1974 that of Indonesia crude rose by 100 per cent. Only when a longer period is considered, say 1972 to 1975, do the two prices appear to move uniformly. Secondly, there is no necessarily parallel movement of the prices of petroleum products with those of crude. Between 1972 and 1974 when the price of Saudi Arabian crude rose by 376 per cent, Singapore's posted prices for gasolene rose by 270 per cent with accompanying rises for kerosene of 213 per cent, for diesel oil of 245 per cent and for other fuel oils of 300 per cent. The reason for divergences, of course, is that crude oil is only part of the cost of petroleum products: wages and capital costs of refineries have also to be considered and they did not rise so rapidly.

81. The specific terms of trade for crude petroleum in developing ESCAP countries did not deteriorate much between 1970 and 1973. However, in 1974, they fell by 74 per cent and subsequently recovered very little, and only temporarily, as a further rise in the price of Saudi Arabian crude by 36 per cent in 1979 reversed an improvement in 1977 which had been sustained in 1978. Specific terms of trade for petroleum products had also declined only slowly up to 1974 but, in that year, they more than halved

and there was further deterioration in 1976, 1978 and 1979. Over the whole decade, therefore, the specific terms of trade for Saudi Arabian crude fell by 73 per cent with corresponding falls of 70 per cent for gasolene, 62 per cent for both kerosene and diesel oil, and again 70 per cent for fuel oils.

82. There was, fortunately for the developing ESCAP region, nothing like that deterioration in its general terms of trade. These had been fairly steady from 1970 to 1973 because the world boom pushed up the prices of important export commodities. As the boom collapsed export prices rose more slowly and dearer oil added to the wage-push in industrial countries to raise import prices. The general terms of trade thus fell by nearly a quarter in 1974 but thereafter they improved fairly steadily to reverse about half the 1974 deterioration. By 1979, accordingly, the general terms of trade had declined by only 12 per cent — serious enough — as against the 62-73 per cent declines in the specific terms of trade for crude petroleum and its products.

83. Terms of trade, however, are only an inverse measure of the unit real cost of imports in terms of exports. A more aggregative measure of the real cost of dearer petroleum to developing ESCAP countries is the change in the ratio of the value of petroleum imports to that of total exports. That is shown in table 10 for some 20 developing ESCAP economies.

84. On this measure, the real cost of petroleum imports doubled or trebled in most developing ESCAP countries between 1973 and 1979. For Afghanistan, Kiribati, Malaysia, the Republic of Korea, Solomon Islands, Sri Lanka, Thailand and Tonga it about doubled, as was the case, too, for the entrepôt State of Singapore with its big refining industry. For India, Papua New Guinea, the Philippines and Samoa, it about trebled, although change was irregular in the last. In Fiji there was a rise of about one half, in Nepal no apparent change, and little change in oil-producing Burma. The position is more doubtful in Bangladesh and Pakistan. It may be better to take the average of 1973 and 1974

Table 10. Developing ESCAP economies. Ratios of the value of petroleum imports to total export receipts, 1973-1979

(Percentages of export values)

	1973	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*Average 1975-1978*
Afghanistan	6.3	4.8	10.1	9.3	11.8	12.5	16.0	10.9
Bangladesh	6.8	20.7	25.1	30.1	45.5	32.3	22.5	33.3
Burma	4.0	0.3	5.2	5.4	1.4	...	...	...
Fiji	21.0	27.9	27.1	31.2	33.0	28.2	33.8	29.9
Hong Kong	2.9	6.9	6.9	6.2	6.5	5.6	6.4	6.3
India	9.0	17.6	31.1	24.6	25.4	28.5	29.3	27.5
Indonesia	1.4	2.5	3.6	5.1	6.7	5.0	(6.0)[a]	5.1
Kiribati	4.7	2.4	3.3	7.7	11.5	7.1	...	7.4
Malaysia	5.3	9.8	11.1	9.7	9.2	8.6	9.5	9.7
Nepal	21.1	20.6	16.7	17.2	24.6	22.7	20.4	20.3
Pakistan	6.8	13.7	32.0	32.4	35.1	33.3	33.5	33.2
Papua New Guinea	3.7	6.4	11.9	10.2	...	...	...	...
Philippines	10.3	24.1	33.6	34.6	31.5	30.1	(28.8)[a]	32.5
Republic of Korea	9.2	22.9	26.4	21.5	20.6	18.2	(20.0)[a]	21.7
Samoa	12.9	6.2	42.9	30.0	27.7	35.5	...	34.0
Singapore	18.0	34.5	37.1	37.7	32.4	30.7	(31.2)[b]	34.5
Solomon Islands	8.6	8.8	18.7	13.8	11.8	11.7	5.9	14.0
Sri Lanka	11.2	25.8	21.9	24.1	20.9	18.2	26.6	21.3
Thailand	14.5	25.2	31.4	27.5	29.3	27.5	(28.0)[a]	28.9
Tonga	14.0	12.9	15.7	45.0	28.6	43.3	41.4	33.2

Source: Asian Development Bank, *Key Indicators of Developing Member Countries of ADB* (Manila), vol. XI, No. 1, April 1980.

Notes: [a] Based on first eleven months.
[b] Based on first six months.

ratios as an indicator of what was normal for them, if so, the change for Bangladesh would be rather more than a doubling and for Pakistan nearly a trebling.

85. The burden of petroleum imports has thus become a very heavy one for many countries. In Fiji, India, Nepal, Samoa, Sri Lanka, Thailand and Tonga these imports have recently absorbed 20 to 30 per cent of export receipts and, in Bangladesh, Pakistan and the Philippines, about one third.

86. The above two measures of real cost are related because the ratio of the value of petroleum imports to export receipts depends upon petroleum prices and export prices, and so upon the specific terms of trade of petroleum. It can be shown that the change in the ratio depends upon

$$r^* + q^* - q$$

where r^* is the growth rate of the real price of petroleum imports in terms of exports (or the growth rate of the inverse of the specific terms of trade for petroleum imports), q^* is the growth rate of the quantity of petroleum imports and q is the growth rate of the quantity of exports.[23]

87. Data are available for five ESCAP countries, from 1973 only, for an application of this analysis of change in the ratio of petroleum imports to export receipts, and are given in table 11. It again brings out the unevenness of the 1973-1974 rise in the real price of oil (r^*) between different countries although the substantial nature of the rise is apparent in all five countries in the table. For India, the Republic of Korea and Singapore there were subsequent small declines in the real price until 1979 but small rises for the Philippines and Thailand.

88. The signs of the compound term, $r^* + q^* - q$, agree fairly well with those for changes in the ratio of petroleum imports to total exports in table 10, and, as is also to be expected, there are wide differences in the contributions of its components to changes in the ratio.

89. In India there were substantial declines in the quantity of oil imports in 1973 and 1974 to reduce the impact of the higher real oil price on the ratio, although it jumped in 1974 and again in 1975, when the quantity of oil imports markedly rose. After 1973, too, there were offsetting increases in the quantity of exports to hold down the ratio, and it actually fell in 1976.

90. The 1974 rise in the price of oil did not make the Republic of Korea reduce the quantity of its oil imports but sharply checked the real rate of growth. After that there was a strong recovery in real growth rates for both exports and oil imports so that the oil import value ratio improved.

91. In the Philippines the 1974 real price increased at little more than half the rate for the Republic of Korea and after that kept on rising. The quantity of oil imports rose markedly in 1974 and the value of oil imports also rose. So, after 1974, did the quantity of exports so that the import ratio fell after 1975.

92. Singapore also had a comparatively small jump in both the real price and the quantity of oil imports during 1974. But for a fall in the quantity of its exports the import ratio would have fallen in 1975, and did fall a little after that mainly because of increases in the quantity of exports. Here adjustment to dearer oil was comparatively quick and smooth.

93. Thailand, in 1974, partly offset the steep rise in the real price of oil by reducing the import quantity and increasing the export quantity. After that both the real price of oil and its import quantity continued to rise but the export quantity also rose sufficiently, in 1976 although not in 1977, to reduce the import ratio.

C. BALANCES OF PAYMENTS

94. The immediate financial impact of higher oil prices on those developing ESCAP countries which are not oil exporters was a sudden and acute worsening of their current external balances of payments. In the aggregate, their current external deficits

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[23] Let V^*, P^*, Q^* be money value, money price and quantity of petroleum imports, and

V, P, Q, be money value, money price and quantity of exports.

Then the ratio of the value of petroleum imports to export receipts, denoted by A, is

$$A = \frac{V^*}{V} = \frac{P^*Q^*}{PQ}$$

Let corresponding lower case letters denote instantaneous rates of change in the variable concerned, and obtain

$$a = (p^* - p) + (q^* - q)$$

But the specific trems of trade for petroleum imports, denoted by T^*, is

$$T^* = \frac{P}{P^*}$$

and the instantaneous rate of change in T is

$$t^* = p - p^*$$

The inverse of T is

$$r^* = \frac{p^*}{p}$$

the real unit cost of petroleum imports in terms of exports, and

$$R = p^* - p$$

Hence a, the rate of change in the ratio of the value of petroleum imports to export receipts, is

$$a = r^* + q^* - q\ .$$

Table 11. Five ESCAP countries. Annual percentage changes in the unit values and quantities of petroleum imports and of total exports, 1973-1978

	1973	*1974*	*1975*	*1976*	*1977*	*1978*
India						
p*	55.2	233.2	6.3	4.2	10.0	
p	23.1	23.8	10.2	11.5	—4.2	12.1
therefore r*	32.1	209.4	—3.9	—7.3	14.2	
q*	—50.1	—70.8	93.4	—5.2	8.2	
q	0.0	11.6	4.0	19.5	8.8	—3.7
r* + q* — q	—18.0	127.0	85.5	—32.0	13.6	
Philippines						
p*	26.4	223.1	11.9	7.3	6.7	
p	45.9	66.1	—20.4	—12.4	1.5	12.1
therefore r*	—19.5	167.0	32.3	19.7	5.2	
q*	—0.2	24.2	6.0	8.3	4.9	
q	7.7	—10.7	—5.9	28.1	20.6	—3.0
r* + q* — q	—27.4	201.9	32.4	—0.1	—10.5	
Republic of Korea						
p*	11.8	235.1	25.8	6.4	5.7	
p	26.6	24.3	—5.6	11.7	9.5	10.7
therefore r*	—14.8	300.2	—1.4	—5.3	—3.8	
q*	24.3	9.2	5.4	17.4	18.8	
q	56.8	9.3	22.9	35.9	19.0	14.2
r* + q* — q	—47.3	210.9	13.9	—23.8	—4.0	
Singapore						
p*	81.5	136.4	20.3	6.1	6.3	
p	23.0	42.2	—2.7	6.5	8.1	3.6
therefore r*	58.5	94.2	23.0	—0.4	—1.8	
q*	—64.8	67.5	—20.9	18.4	1.3	
q	22.0	9.8	—8.4	18.7	16.0	11.6
r* + q* — q	—28.3	151.9	10.5	—0.7	—16.5	
Thailand						
p*	27.8	233.7	7.7	8.9	7.8	
p	53.3	38.0	—5.7	—2.7	2.2	9.5
therefore r*	—25.5	195.7	13.4	11.6	5.6	
q*	8.8	—60.8	4.7	9.1	17.3	
q	—6.5	11.9	—4.2	38.9	14.5	6.6
r* + q* — q	—10.2	123.0	22.3	—18.2	8.4	

Source: Asian Development Bank, *op. cit.*

Notes:
p* = growth rate of money price of petroleum imports.
p = growth rate of money price of total exports.
r* = p* — p = growth rate of real price of petroleum in terms of exports.
q* = growth rate of the quantity of petroleum imports.
q = growth rate of the quantity of total exports.

jumped from $US 2.6 billion in 1973 to $US 9.9 billion in 1974 and to $US 8.8 billion in 1975.[24] During the next two years they fell to $US 1.5 billion but rose to $US 5.6 billion in 1978 and, after the second big rise of oil prices, to $US 13.5 billion in 1979 although there were other causes of this large deficit. Table 12 throws light upon both the current and capital sides of the balance of payments account for 11 developing ESCAP countries including those for Indonesia which has long been a net exporter of oil and Malaysia which had recently become one.

95. In 1974-1975 the balance of trade in goods and services deteriorated sharply for all of these countries except the two oil-producers, Burma and Indonesia, although the improvement in Indonesia's trade balance was surprisingly small considering that its oil receipts had trebled. The worst affected country was Bangladesh the adverse trade balance of which became 190 per cent of its export receipts, and Pakistan the corresponding proportion for which was 105 per cent. Both were helped by official grants and loans from Development Assistance Committee (DAC) countries, OPEC countries and multilateral agencies but had also to run down their reserves of foreign exchange.

96. The Philippines was the next worst affected with an adverse trade balance equal to 35 per cent of its export receipts, followed by Sri Lanka for which this proportion was 28 per cent. Each was able to finance about a third of its deficit by official grants supplemented by private transfers. Sri Lanka financed the remainder by official loans, none as yet from OPEC. The Philippines financed about half of its current deficit in the same way, turning for the remainder to world financial markets where it raised private and public loans to such an extent that it could add substantially to its exchange resources.

97. The other countries listed in the table had trade deficits around 22 per cent of their export receipts. In absolute terms, India, of course, had much the largest one. The table seems to show that this was more than covered by grants and private transfers, mostly grants; it also seems to show that India needed to add only an exceptionally small sum to its external public debt. However, this could be misleading. In 1974, India and the United States agreed to terminate the arrangements which had enabled India to obtain United States farm products by rupee credits with the result that $US 1,679 million in the United States rupee account was transferred to the Indian Government. This sum appeared in the official account for the balance of payments as a grant, and a matching sum was then put into the capital section of the account as a repayment of public debt to the United States. When these book-keeping arrangements are ignored it would seem that, in 1974-1975, India received SDR 486 million for the two years in official grants and another SDR 1,580 million in official loans.

98. Thailand was also able, in 1974-1975, to cover about a third of its trade deficit by grants and private remittances, the latter being swollen by funds connected with otherwise unrecorded trade. It also received such large inflows of private capital that it could finance the remainder of its deficit with hardly any new official borrowing and still add a large sum to exchange reserves. Malaysia, too, received a net private capital inflow which more than covered its current deficit to permit a substantial increase of exchange reserves. Singapore's private capital inflow, although apparently not increasing over the level of the previous two years and falling far short of its current deficit, enabled it also to increase exchange reserves; but "other items and errors" in Singapore's account was a fairly large entry.

99. The Republic of Korea met most of its large trading deficit by a net inflow of private capital, obtained, as in the case of the Philippines, by heavy borrowing on international financial markets. That, too, was on such a scale as to cause net additions to exchange reserves.

100. Indonesia, although its current balance of payments did not become more adverse, was in serious trouble in 1974-1975 over the capital side because of heavy repayments or withdrawals of private capital. There was little increase in the flow of official loans from any source so that it also had recourse to large-scale borrowing on world financial markets, but not enough to prevent some loss of exchange reserves.

101. A very significant feature of these years was the new resort of some developing Asian countries to international capital markets. For the ESCAP region there was a jump in such borrowing from $US 697 million in 1973 to $US 2,078 million in 1974, then to $US 3,397 million in 1975. In the first two years of the oil crisis, the main borrowers among developing ESCAP countries and areas were Hong Kong, Indonesia, the Philippines and the Republic of Korea; they were soon to be joined by Singapore, Thailand and, on a lesser scale, by Burma, Fiji and Papua New Guinea.

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[24] International Monetary Fund, *Annual Report 1980* (Washington D.C., 1980), table 5, p. 17.

Table 12. Selected ESCAP countries. Balances of payments, 1972-1978
(Million SDR)

	Average	*Average*	*Average*	*1978*
	1972-1973	*1974-1975*	*1976-1977*	
Bangladesh				
Merchandise trade and services	—428[a]	—716	—510	—817
Grants and private transfers	229[a]	280	275	509
Current balance	—199[a]	—436	—235	—308
Private capital	—18[a]	0	—19	—3
Public capital	97[a]	395	279	328
Change in reserves	147[a]	53	—21	—76
Other items and errors	—28[a]	—12	—4	58
Burma				
Merchandise trade and services	—62	—49	—69	—144
Grants and private transfers	16	13	12	20
Current balance	—46	—36	—57	—124
Private capital	—	—1	1	—
Public capital	34	42	33	98
Change in reserves	—10	—6	20	19
Other items and errors	22	—	4	7
India				
Merchandise trade and services	—537	—768	473[b]	...
Grants and private transfers	242	1 217	897[b]	...
Current balance	—295	449	1 370[b]	...
Private capital	—23	—76	37[b]	...
Public capital	348	79	767[b]	...
Change in reserves	83	—95	—1 889[b]	...
Other items and errors	—112	—357	—285[b]	...
Indonesia				
Merchandise trade and services	—400	—240	—431	—1 021
Grants and private transfers	46	32	17	11
Current balance	—354	—208	—414	—1 010
Private capital	266	—759	73	113
Public capital	345	579	1 142	1 128
Change in reserves	—330	67	—820	—121
Other items and errors	73	321	19	—110
Malaysia				
Merchandise trade and services	—19	—353	532	18
Grants and private transfers	—52	—31	—31	—34
Current balance	—71	—384	501	—16
Private capital	252	489	151	392
Public capital	47	67	120	167
Change in reserves	—126	—93	—524	—198
Other items and errors	—98	—80	—249	—345
Pakistan				
Merchandise trade and services	—299	—1 080	—1 313	—1 805
Grants and private transfers	160	267	665	1 217
Current balance	—139	—813	—648	—588
Private capital	31	118	160	119
Public capital	175	287	329	421
Change in reserves	—64	141	1	—3
Other items and errors	—2	268	158	51

Table 12 *(continued)*

	Average *1972-1973*	*Average* *1974-1975*	*Average* *1976-1977*	*1978*
Philippines				
Merchandise trade and services	19	—712	—1 060	—1 175
Grants and private transfers	183	246	228	250
Current balance	202	—466	—832	—925
Private capital	223	499	709	1 205
Public capital	—3	321	228	509
Change in reserves	—368	—247	72	—626
Other items and errors	—54	—106	—177	—163
Republic of Korea				
Merchandise trade and services	—457	—1 792	—372	—1 258
Grants and private transfers	158	185	244	373
Current balance	—299	—1 607	—128	—885
Private capital	259	1 463	981	1 424
Public capital	210	272	425	249
Change in reserves	—292	11	—1 116	—423
Other items and errors	122	—138	—162	—365
Singapore				
Merchandise trade and services	—478	—678	—467	—572
Grants and private transfers	0	—32	—40	—24
Current balance	—178	—710	—507	—596
Private capital	474	442	629	476
Public capital	12	4	3	7
Change in reserves	—328	—290	—263	—509
Other items and errors	318	553	138	622
Sri Lanka				
Merchandise trade and services	—37	—152	—2	—115
Grants and private transfers	11	50	55	62
Current balance	—26	—102	53	—53
Private capital	—3	—5	—9	12
Public capital	48	88	59	50
Change in reserves	—20	32	—110	—52
Other items and errors	1	—13	7	44
Thailand				
Merchandise trade and services	—131	—419	—688	—1 008
Grants and private transfers	88	134	28	55
Current balance	—43	—285	—660	—953
Private capital	213	414	610	915
Public capital	111	—2	69	183
Change in reserves	—190	—176	—39	—28
Other items and errors	9	50	21	—117

Source: International Monetary Fund, *Balance of Payments Yearbook, 1979* (Washington D.C., 1980).

Notes: [a] 1973.
[b] 1976.

102. Over the next three years, 1976 to 1978, trade deficits became worse for Bangladesh, Burma, Indonesia, Pakistan, the Philippines and Thailand, and did not improve much for the Republic of Korea or Sri Lanka. There was, however, a striking improvement for India and Malaysia, one connected with the development of their own petroleum fields. Malaysia's exports of crude and partly-refined petroleum rose from $US 124 million in 1973 to $US 367 million in 1976 and to $US 1,013 million in 1978. It was thus able to add large sums to foreign exchange reserves as its current balance swung into resulting surplus and as its external public borrowing doubled. India, too, had favourable trade balances in 1976-1977, and a big rise in transfer payments from nationals who had gone to take advantage of expanding demands for labour in the oil-producing countries of the Middle East. Official external borrowings also rose so that there was a big increase of exchange reserves.

103. For both Bangladesh and Pakistan the trade deficit became worse, but increased official grants and remittances from their workers who had also gone to the Middle East led to some improvement of the current balance in 1976-1977, heavily adverse though it remained. They were helped by loans from members of DAC and OPEC and from multilateral agencies. Burma suffered further deterioration of both its trade and current balances so that it had to seek more official loans and, from 1977, to borrow in world capital markets.

104. After 1975 Indonesia and the Republic of Korea had to increase their already heavy reliance upon loans from world markets. Indonesia's current balance, despite its position as an important petroleum exporter, became heavily and increasingly adverse so that, although its private capital inflow again became positive, the Government had to borrow from official sources and still more from world financial markets.

105. The Republic of Korea's trade balance, heavily adverse in 1975, improved substantially during the next two years because of a big expansion of exports, but again became heavily adverse in 1978 and there were corresponding movements in its current balance. The situation was largely met by large private borrowing in international financial centres and, to a lesser extent, by government borrowing. The Philippines, Sri Lanka and Thailand also met increasing current deficits by borrowing abroad, an activity shared, in varying degrees, by Government and business.

106. It would be illuminating to supplement the information about balances of payments given in table 12 by information about sources of grants and loans, both public and private. There is information about aid disbursements by groups of donor countries, such as DAC and OPEC, and by multilateral agencies, such as the International Monetary Fund (IMF), the World Bank and ADB. Unfortunately, it is not possible to match these disbursements of aid by donors with corresponding items for grants and loans in the recipient countries' accounts for the balance of payments, the discrepancies often being very wide. (Reasons for this are complex and are not canvassed here.) Nonetheless it is of some interest to reproduce, in table 13, Organisation for Economic Co-operation and Development (OECD) estimates of donor disbursements of aid to developing Asian countries.

107. Over the whole period, 1974-1978, covering the years from the first to the second big jump in oil prices, net flows of financial resources from market economies to developing ESCAP countries amounted to $US 46,181 million. About a quarter of it was provided through multilateral agencies, two fifths as direct grants or loans by DAC countries and one tenth as grants or loans by members of OPEC. In addition, another quarter came in the form of private loans raised in DAC countries, more especially in international financial centres.

108. The 11 countries listed in table 12 received nearly 85 per cent of all the net external financial flows listed in table 13 to the developing ESCAP region and nearly three quarters of it went to six of them — Bangladesh, India, Indonesia, Pakistan, the Philippines and the Republic of Korea. Indonesia and the Philippines obtained about half these flows by net private borrowing and the Republic of Korea about two fifths of its flow in the same way.

109. Nine of the countries listed, all except Indonesia and Singapore, obtained one to two fifths of their external finance from multilateral agencies and in this connexion the IMF Oil Facility is of some significance. Under it, and up to June 1980, India had obtained SDR 401 million, Pakistan SDR 236 million, the Philippines SDR 410 million, the Republic of Korea SDR 253 million and Sri Lanka SDR 78 million. Yet the total aid to developing ESCAP countries under the facility was less than an eighth of all multilateral aid disbursed to them, and so was far from adequate to meet their difficulties in paying for dearer oil imports.

110. Direct OPEC aid to the ESCAP region went mainly to south Asian countries, 44 per cent of it to Pakistan, 32 per cent to India, 7 per cent to Bangladesh and 3 per cent to Sri Lanka. The Republic of Korea received somewhat more than

Table 13. Selected ESCAP economies. Net flows of financial resources from donor sources, 1974-1978
($US millions)

	DAC countries		*OPEC countries*	*Multilateral agencies*	*Total*	*Borrowing on financial markets*
	Net official	*Net private*				
Bangladesh	2 421	10	299	1 163	3 893	—
Burma	335	74	—	231	640	49
India	3 082	—58	1 287	2 869	7 180	105
Indonesia	3 138	4 293	79	1 209	8 719	4 313
Malaysia	382	505	25	391	1 303	2 165
Pakistan	1 703	—19	1 786	858	4 328	41
Philippines	934	1 951	17	726	3 628	5 220
Republic of Korea	1 815	2 334	147	1 585	5 881	4 310
Singapore	154	739	—	109	1 002	514
Sri Lanka	570	—76	130	284	908	—
Thailand	512	285	78	567	1 442	580
Developing ESCAP	19 616	11 729	4 074	10 768	46 187	6 658

Source: Asian Development Bank, *op. cit.*, tables 38 and 41–44.

Sri Lanka, and Indonesia, Thailand, Malaysia and the Philippines somewhat less. Direct grants and official loans by DAC countries provided more than three fifths of aid to Bangladesh and Sri Lanka, more than half of aid to Burma and more than a third of aid to India, Indonesia and Thailand.

111. Three quarters of the external finance coming to Singapore was in the form of net private capital flows from DAC countries; for Indonesia and the Philippines the proportion was around one half, for Malaysia and the Republic of Korea around two fifths and for Thailand one fifth. Some of these private capital flows would have involved borrowing on Euro-money and international bond markets but, as has been mentioned previously, a good deal of such borrowing was also done by Governments which could not obtain all they required from bilateral official loans or from multilateral agencies, at least on terms which they regarded as acceptable or advantageous.

112. The last column of table 13 shows private plus public borrowing on world financial markets. Indonesia, the Philippines and the Republic of Korea obviously made heavy use of these markets as, to a lesser extent, did Malaysia, Singapore and Thailand.

113. One important consequence of official and commercial borrowing on the scales indicated above is a rise in the ratio of service payments on external debt to export receipts. According to OECD figures[25] which are based on creditors' reports of both public and private indebtedness (whether guaranteed by debtor's Governments or not), this ratio, in 1976, was near to 20 per cent for Bangladesh, Pakistan and Sri Lanka, 17 per cent for Burma and the Philippines, and 10-13 per cent for India, Indonesia and the Republic of Korea.

114. The World Bank gives similar figures but only for public or publicly guaranteed external debt.[26] They show that, on this more restricted basis, the corresponding debt service ratio rose sharply, between 1974 and 1978, for three countries; Bangladesh from 5.5 to 13.7 per cent, Indonesia from 3.9 to 12.2 per cent, the Philippines from 5.2 to 13.4 per cent. In Burma it rose from 12.9 to 18.1 per cent, and in Pakistan from 15.4 to 20.8 per cent. It was fairly steady in the Republic of Korea at 10-11 per cent and fell in Sri Lanka from 12.0 to 9.2 per cent.

115. The general conclusion from this evidence about balances of payments is that nearly all developing ESCAP countries were able to increase their consumption of commercial energy after 1974 and, in particular, their consumption of petroleum, but

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[25] Reproduced in UNCTAD, *Handbook of International Trade and Development Statistics, 1979*, table 5.13.

[26] See, for example, ADB, *op. cit.*, table 31.

that it involved considerable financial strains which had to be met by official aid and, in some cases, by heavy public or private borrowing in world financial centres. Such recycling of international liquidity enabled most countries to make considerable adjustments to the disturbance of higher real petroleum prices and the subsequent recession of world trade but at the cost of greater external indebtedness. There is now much concern about the ability of energy-deficient countries to adjust to further real rises in the price of petroleum without damaging their development prospects. There is particular concern about further large recycling of petro-dollars through commercial banks and other private financial intermediaries. Some may already have reached or passed prudent limits of commitment to borrowing countries in the developing world, and some of these countries may have passed limits of credit-worthiness for further large loans.

116. Considerations of this kind have strengthened suggestions for increasing the resources of multilateral agencies and for altering their policies in regard to loans or grants, so as not only to ensure that oil-deficient developing countries have reasonable access to finance for petroleum supplies and other development purposes but also to avoid further stagnation of world trade and industrial activity by offsetting the deflationary effects of a further shift of world liquidity to oil-exporting countries. Because of their small populations or very limited natural resources beyond oil, these countries cannot easily increase their own imports on a scale commensurate with their financial surpluses.

117. It is true that the members of OPEC, recognizing the problems facing oil-importing developing countries, have contributed a good deal of official development assistance, about a third as much as DAC countries did in 1977 and more than 2 per cent of their own GDPs as compared with 0.3 per cent for DAC countries. Yet most of their balance of payments surpluses has gone into rather short-term financial assets in advanced countries, thereby providing a credit basis there for loans by financial intermediaries to developing countries. As has been mentioned, such relending may not be able to continue at anything like the previous pace. Some more stable and durable arrangements, therefore, have come to seem necessary for ensuring that higher real prices for oil do not impede world development, and particularly the economic progress of low-income countries.

D. EFFECTS ON PRODUCTION

118. The large net financial flows to developing ESCAP countries, whatever their longer-term consequences may be, enabled these countries to maintain fairly satisfactory growth rates of real GDP. According to recent estimates made by the World Bank[27] low-income countries in Asia (i.e. those with *per capita* incomes below $US 300 in 1977) had increased their real GDP by 4.2 per cent in 1960-1970 and maintained this rate in 1970-1980. Middle-income countries in east Asia and the Pacific, however, had a corresponding increase in this growth rate from 7.7 to 8.0 per cent.

119. Table 14 gives more detailed information about growth rates for economic activity in some 11 developing ESCAP countries, including the net oil exporters, Indonesia and Malaysia. It should be looked at together with table 5 which showed utilization of commercial energy by economic sectors. A satisfactory analysis of the effect of higher petroleum prices upon the outputs of leading economic sectors could be made only by input-output tables which were sufficiently detailed to include crude petroleum and petroleum products as separate inputs or outputs. None are yet available for developing ESCAP countries so that here all that can be attempted are rough and ready judgements based on such information as that contained in the two last tables and supplemented by general reports of economic conditions in particular countries.

120. The World Bank's finding that growth rates of real GDP were maintained despite higher petroleum prices after 1973 is confirmed by table 14 in regard to Pakistan, the Philippines, the Republic of Korea, Singapore and Thailand, as well as in oil-producing Burma and India, and also in Fiji and Sri Lanka.

121. Lower rates in Burma, Fiji, India and, to a lesser degree, in Sri Lanka were associated with slackening of output growth in agriculture. In these countries, relatively little petroleum goes to providing energy for agricultural operations but nitrogeneous fertilizers are also derived from petroleum and there was some decline in their usage in Sri Lanka during 1973/74 and in India during 1974/75.[28] (In Bangladesh there was a bigger decrease of one third during 1973/74.) The lower growth rates of real GDP in Burma, Fiji and Sri Lanka were also associated with lower growth rates for manufacturing and, except in Sri Lanka, for transport, both sectors being relatively large users of petroleum products.

122. During 1973 and 1974, the other seven countries had increased or steady growth rates for agriculture, manufacturing, construction and transport with a few unimportant exceptions. In oil-rich Indonesia transport growth slowed a little, in

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[27] *World Development Report*, *op. cit.*, table SA1.

[28] FAO, *Annual Fertilizer Review, 1976* (Rome, 1977), table IV.

Table 14. Selected ESCAP economies. Average annual percentage rates of growth of gross domestic product at constant prices by kinds of economic activity, 1970-1977

	1970-1972	*1973*	*1974*	*1975*	*1976*	*1977*
Burma						
Agriculture	4.4	1.8	1.9	1.7	1.8	2.1
Manufacturing	4.2	1.6	0.6	0.6	1.3	2.0
Construction	—3.1	—1.9	—2.5	—2.3	—1.6	—0.6
Transport etc.	7.4	2.8	1.1	0.8	0.7	0.8
GDP	4.5	2.8	2.4	2.3	2.4	2.7
Fiji						
Agriculture	3.2	1.1	1.1	1.0	...	...
Manufacturing	10.7	7.8	6.9	5.9	...	...
Construction	4.8	9.0	6.4	3.6	...	...
Transport etc.	19.7	16.4	14.9	13.4	...	...
GDP	10.3	9.8	8.2	7.3	6.4	5.9
India						
Agriculture	3.6	0.6	0.3	1.2	1.1	...
Manufacturing	2.8	3.2	3.1	3.0	3.4	...
Construction	—0.7	—1.1	—0.6	1.0	2.3	...
Transport etc.	3.3	2.4	2.5	3.3	3.8	...
GDP	2.2	1.7	1.5	2.2	2.4	...
Indonesia						
Agriculture	3.8	4.2	4.5	4.1	4.0	3.9
Manufacturing	10.7	13.4	14.0	14.0	13.7	13.4
Construction	24.0	23.5	23.0	21.9	19.9	18.0
Transport etc.	15.0	14.2	13.6	12.5	12.0	11.9
GDP	7.2	8.4	8.5	8.2	7.9	7.8
Malaysia						
Agriculture	7.6[a]	9.7	9.0	6.4	6.2	5.7
Manufacturing	10.2[a]	16.2	15.0	12.3	12.4	12.2
Construction	5.5[a]	9.7	10.8	6.4	5.6	6.0
Transport etc.	13.9[a]	14.4	14.5	14.2	13.2	12.7
GDP	9.4[a]	10.5	10.0	8.0	7.8	7.8
Pakistan						
Agriculture	—0.7	1.7	1.4	1.6	1.7	1.8
Manufacturing	0.3	3.0	2.9	2.6	2.2	2.4
Construction	—2.3	1.6	4.8	7.5	7.9	8.1
Transport etc.	0.9	5.9	5.9	5.4	4.8	5.0
GDP	1.0	3.2	3.5	3.7	3.7	3.9
Philippines						
Agriculture	1.4	2.2	2.4	2.6	3.1	3.5
Manufacturing	6.6	7.6	7.3	6.8	6.5	6.4
Construction	—9.3	5.3	8.0	11.3	14.0	14.8
Transport etc.	6.2	6.2	6.3	6.4	6.6	6.6
GDP	4.8	5.5	5.7	5.9	6.1	6.2
Republic of Korea						
Agriculture	—0.5	1.7	2.5	3.0	3.6	3.8
Manufacturing	19.0	19.6	19.5	18.9	18.8	18.5
Construction	2.2	5.1	6.1	7.3	8.2	9.7
Transport etc.	16.7	16.2	15.4	14.7	14.6	14.8
GDP	8.6	9.3	9.5	9.3	9.6	9.8
Singapore						
Agriculture	0.8	3.0	1.1	0.6	1.2	1.5
Manufacturing	1.9	11.8	11.3	9.6	9.1	8.8
Construction	12.5	9.5	7.6	7.9	8.2	7.6
Transport etc.	—1.3	11.3	12.0	12.0	12.1	12.5
GDP	1.7	8.8	8.9	8.4	8.2	8.0
Sri Lanka						
Agriculture	0.7	—0.1	0.7	1.3	1.5	2.1
Manufacturing	10.9	7.5	9.4	8.9	8.1	7.2
Construction	—4.0	—5.3	—3.8	—1.6	—0.1	0.3
Transport etc.	3.6	5.7	4.4	4.8	5.4	5.4
GDP	4.1	2.9	3.9	4.1	4.3	4.2
Thailand						
Agriculture	3.1	4.0	4.1	4.2	4.2	3.8
Manufacturing	10.3	12.5	11.4	10.5	10.4	10.6
Construction	—1.5	—5.5	—4.2	—2.5	—0.0	2.0
Transport etc.	6.7	6.5	6.8	6.9	7.2	7.1
GDP	6.8	7.1	6.9	6.7	6.7	6.7

Source: *Yearbook of National Account Statistics, 1978* (United Nations publication, Sales No. 3.80. XVII.8, vol. II).

Note: [a] 1972.

Singapore construction activity fell from an exceptionally high growth level and in the Republic of Korea transport growth fell off a little but remained high.

123. On a longer perspective up to 1976 or 1977, growth rates rose above their average 1970-1972 levels for manufacturing, construction and transport, major users of commercial energy, in India, Malaysia, Pakistan, the Philippines, the Republic of Korea, Singapore (except in regard to construction) and Thailand. One way or another, therefore, these countries had managed to prevent the first big rise of oil prices from adversely affecting their general rates of growth or those of their major energy-consuming sectors.

124. Reduced growth rates for all these sectors in Burma and for Indonesia could not have been due to scarcer oil as those two countries do not have net imports of petroleum nor need them. Fiji, however, is heavily dependent on petroleum imports and suffered reduced growth rates for all four sectors. Sri Lanka's growth rate for manufacturing declined but was still fairly high, it did not have to curtail growth of transport and gradually ended a long decline of construction activity.

125. The 1973-1974 increase in oil prices, accordingly, does not appear to have had deleterious effects on productive activities in most developing ESCAP countries and a few, such as the Republic of Korea and Singapore, continued to make striking economic progress despite it. The main strains, up to 1978, were external financial burdens, current and prospective, and it was through incurring them, and receiving aid, that developing ESCAP countries were able to continue or step up their own economic growth. The more recent increase of petroleum prices, however, may well have more serious consequences for economic growth of ESCAP countries if external finance is not to be had on the previous scale.

III. SHORT-TERM MANAGEMENT OF ENERGY DEMAND AND SUPPLY

126. The developing ESCAP countries adopted various economic policies in response to the energy problems of the 1970s. The general picture has been that, prior to the 1973-1974 price increases for petroleum products, economic policies had concentrated almost exclusively on the management of energy supply to ensure that adequate supplies would be made available to meet anticipated demands. In this process, a number of developing ESCAP countries did move into a faster development of available indigenous sources of energy such as hydropower, coal and natural gas. However, given the relative prices of petroleum and the expectation of continued stability in these prices, the development of alternative indigenous resources was often postponed in favour of the continued usage of petroleum products except where tightening foreign exchange situations tipped the balance in favour of the development of indigenous, less foreign-exchange intensive sources of energy.

127. In the management of energy demand, prior to 1973-1974, there was generally a lack of specific policies except to the extent that there were incident effects on demand arising from policies to increase energy supplies and public revenues. In the area of non-commercial energy, very little (if anything at all) was done in the management of either its supply or demand and, with increasing urbanization, adoption of newer technology and higher real incomes, substitution by commercial fuels became the common picture; the occasional concern about the increasing rate of deforestation being more with its environmental effects than anything else.

128. The picture altered dramatically after 1973-1974 when the sudden change in the relative prices of primary energy sources and the immediate impact on foreign payments necessitated that policy attention switch to aspects of short-term energy demand management. Such policies took various forms in different developing economies of the region and also changed over time. Generally, the policies adopted reflect vividly the problems of decision-making under crisis situations since the unpredictability of both the timing and extent of price increases in petroleum made for grave strains in policy-making in situations of resource scarcity: that the developing countries and areas in the ESCAP region did come through the immediate post-1973-1974 period without major dislocations to their economies should not lead to an underestimation of the severity of the problems which had to be faced.

129. Greater attention was concurrently, also focused on the sources of energy being used and on assuring adequate and regular supplies. The focus of attention moved from increasing energy supplies, *per se*, to conscious policies aimed at reducing the dependence on imported energy supplies and the development of indigenous energy resources while ensuring that total availabilities continued to increase and were more efficiently utilized: interfuel substitution, curtailment of non-essential energy consumption, increased efficiency in energy use and the increased availability of energy supplies all became objects of policy attention.

130. Aspects of the management of energy demand and of energy supply are discussed below.[29] These aspects are closely interlinked where policy option and consequences are concerned and, consequently, the following discussion should be considered as a whole.

A. SHORT-TERM MANAGEMENT OF ENERGY DEMAND

131. In the broadest perspective, the short-term management of energy demand aims at influencing the pattern of final demand for energy, at achieving efficiencies in fuel use and at influencing the input-mix of energy sources through a range of policies which are supportive also of the acceleration of socio-economic growth and the achievement of national objectives.

132. Energy policies ramify in their effects throughout the economy and socio-economic considerations inevitably have to be fully taken into account in determining the feasibility of policies for short-term energy demand management. Policy formulation for the short-term management of energy demand is, thus, a difficult and challenging process and the experiences in the developing ESCAP region during the 1970s in this field are indicative of the complexities of short-term decision making which has to take due account of varied socio-economic objectives.[30]

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[29] Various issues discussed in this chapter have been earlier considered in regional forums and particularly at the Working Group Meeting on Energy Planning and Programming, Bangkok, August 1978.

[30] These socio-economic objectives include the acceleration of economic growth, reduction of poverty and unemployment, reduction of import-dependence in energy, ensuring the financial viability of the energy sector or its subsectors, schieving an optimum source-mix in energy and greater effectiveness in its use, maximizing social welfare, taking account of the needs of regional development within the country, accelerating exports and minimizing impact on the environment.

133. Such considerations alone suggest that policy packages rather than single policy instruments would need to be relied on. Such an approach in policy-making becomes all the more necessary given the unique nature of energy as a commodity and its role in economies characterized by imperfect market structures and skewed income distributions.

134. Within the context of these objectives and within the context of the imperative that energy supplies will need to be continuously increased to accelerate modernization and growth, the primary objective of short-term energy demand management policies will have to be the maximization in use of available energy supplies in a manner that will optimize social benefits. Reduction of either total energy consumption or even consumption in particular sectors has not been the major operative principle in energy demand management in the developing ESCAP countries where a rapid growth in energy consumption is called for to sustain development[31] and where structural rigidities and resource scarcities are real enough to preclude significant short-term adjustments without deleterious effects on output.

1. Price policies

135. Most developing ESCAP economies have, in varying degrees, relied on price policy as the major policy instrument in the management of commercial energy demand. The general approach in most developing ESCAP countries has been to ensure that the retail prices of commercial energy did, at minimum, cover the costs of importation or production and distribution. Taxes and duties increased retail prices in many countries while in some others either energy subsectors or specific energy products were subsidized.

136. The determination of appropriate prices for energy products is a complex exercise. Quite apart from the problems in determining relative price levels due to possibilities of substitution and the considerations of social welfare, the pricing of imported petroleum raises specific problems because of the unique structure of the international oil market.

137. Since 1973-1974, the timing and the amount of petroleum price increases have been determined by OPEC taking into account a variety of factors which, *inter alia,* have included strategic, political, cost, resource depletion and similar considerations. Consequently, international petroleum prices have not, except for their spot-market prices, been subject to market fluctuations.

138. The administrative determination of international petroleum prices at unpredictable intervals and on the basis of many and varied considerations has meant that the real economic cost of the imported petroleum to the importing economy cannot be estimated through the traditional procedure of converting the landed cost (plus distribution margins) at the prevailing rate of exchange.

139. Such a procedure would underestimate the real economic cost particularly where, as in most developing ESCAP countries, prevailing rates of exchange tend to be overvalued. However, in almost all developing countries of the region, petroleum products have been subject to various taxes and duties and, to the extent that such levies were in excess of whatever subsidies were being currently granted, the effects of the overvalued exchange rate were partially or wholly redressed.[32]

140. Table 15 shows the manner in which taxes and duties have impinged on the prices of selected petroleum products in six developing countries. Lack of data has precluded a fuller analysis but it is noted, in particular, that many countries derive added revenues through business taxes and profits from State-owned producing or distributing organizations while some countries (like Thailand) have provided subsidies for ex-refinery prices while, at the same time, imposing taxes and duties. The net effect of such a situation is difficult to assess in the absence of detailed national data. Needless to state, such a detailed analysis has to provide the essential base for decisions in this field.

141. In Burma, Pakistan and Sri Lanka, taxes and duties as a percentage of the net retail price[33] have demonstrated a steady decline from 1971 to 1979 while for India, the Philippines and Thailand such a decline is noted up to 1974 in India, 1975 in Thailand and 1976 in the Philippines. Thereafter, in the latter three countries, taxes and duties again increase perceptibly as a percentage of net retail price. This suggests that retail price increases were muted in the former group of countries by the reducing proportion of taxes and duties and that price increases were accentuated by higher levies in the latter group of countries.

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[31] This approach is vividly illustrated in Pakistan's response to the 1973–1974 petroleum price increases. Policy sought to increase the supply of alternative fuels (gas and hydro) without restricting growth of over-all demand; thereby enabling substitution for oil without much change in relative prices and, yet, without reducing the absolute consumption of oil since only its share of an increased energy supply was sought to be reduced. (See Masood Ahmed, *The Effect of Higher Oil Prices on Technology and Employment in Pakistan* (Geneva, ILO, 1979).)

[32] However, the unanswered problem will still remain whether or not the landed cost (in foreign exchange terms) of the petroleum imports reflects the real economic cost to the importing country.

[33] Excluding taxes and duties.

Table 15. Selected ESCAP countries. Taxes and duties as a percentage of net retail prices for selected petroleum products

	1971	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*	*Absolute amount of taxes and duties per unit*	
	(percentages)									*1971* *(national currencies)*	*1979*
Burma											
Regular	121	124	127	65	47	6	2	8	7	1.16	0.20
Premium	93	96	100	50	39	5	17	17	17	1.16	2.53
Kerosene	25	30	4	38	60	5	6	7	7	0.20	0.13
India — New Delhi											
Regular	452	419	295	173	227	245	236	236	300	4.13	12.01
Premium	382	382	262	154	199	207	207	218	262	4.16	12.05
Kerosene	124	122	66	57	69	56	56	51	59	1.05[a]	2.12
Pakistan											
Regular	...	...	...	555	718	610	130	74	...	2.93[a]	4.85[b]
Premium	...	...	...	448	197	197	66	65	...	2.93[a]	4.85
Kerosene	...	...	...	157	350	344	288	—	...	0.51[a]	nil
Philippines											
Regular	43	44	41	38	37	35	43	44	...	0.35	1.92
Premium	33	33	31	36	35	32	44	43	...	0.35	2.07
Kerosene	17	18	15	8	9	10	7	7	...	0.14	0.30
Sri Lanka											
Regular	...	...	92	72	49	25	25	1	1	...	2.36
Premium	...	...	92	72	49	25	25	1	1	...	2.44
Kerosene	...	...	47	30	30	10	10	1	1	...	0.28
Thailand											
Regular	94	94	78	75	45	45	58	76	77	3.52	12.25
Premium	82	82	68	69	42	43	52	69	71	3.52	12.25
Kerosene	33	30	29	23	12	13	14	11	28	1.60	3.47

Source: United States, Department of Interior, *International Petroleum Annual*, various issues.

Notes: [a] Taxes not available.

[b] July 1978.

Retail price — duties and taxes = net retail price.

$$\text{Above percentages} = \frac{\text{duties and taxes}}{\text{net retail price}} \times 100.$$

142. The effects on government revenues of these disparate proportionate shares of taxes and duties on petroleum products is, however, dependent on the rates of taxes and duties, the volume of sales and the other taxes levied on the producing, wholesaling or retailing units (which would be reflected in the ex-refinery price and the net retail price rather than as taxes and duties as such).[34]

143. In the five countries for which comparable data are available, taxes and duties on petroleum products, generally increased in absolute terms (in national currency) per US gallon from 1971 to 1979. The exceptions were for regular petrol in Burma and for kerosene in Burma and Pakistan.

144. Thus, in India, the Philippines and Thailand, the upward proportionate trend in duties and taxes has been accompanied by an increase in the absolute amount of taxes and duties levied. In Burma such levies increased only for premium petrol while dropping sharply for other products.

145. These trends would also suggest that over the period 1971 to 1979, in Burma, Pakistan (from 1974) and Sri Lanka, the role of taxes and duties in redressing any overvaluation of the exchange rate declined. In India, the Philippines and Thailand,

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[34] This procedure is particularly of importance when refining units are State-owned and business, profit or turn-over taxes are levied on them which are then reflected in ex-refinery prices rather than as taxes and duties as such.

while the rates of taxes and duties have increased since the mid-1970s, these rates were, in 1979, below the levels of 1971.[35]

146. Given the unique nature of the determination of the international price for oil, domestic retail prices for petroleum products in the importing country would be optimum (even if allowance has already been made for overvaluation in exchange rates) only if their retail prices also kept pace with general price inflation of other commodities.

147. Table 16 shows that nominal retail prices for selected petroleum products increased at annual rates of over 15 per cent during the 1970-1979 period except in Iran and Nepal: in Iran, the nominal retail prices of auto-diesel and kerosene even remained constant over this period.

Table 16. Selected ESCAP countries. Growth rates of nominal and real retail prices for selected petroleum products, 1970-1979

(Percentage growth per annum)

Country		*Product*			
		Super petrol	*Regular petrol*	*Auto diesel*	*Kerosene*
Bangladesh	N	24.7	25.5	19.9	24.8
	R	8.6	11.0	4.5	6.7
Iran	N	9.6	...	0	0
	R	2.6	...	—5.9	—5.9
Nepal[a]	N	7.4	...	14.9	13.4
	R	3.7	...	11.0	9.5
Papua New Guinea .	N	15.6	...	12.2	16.5
	R	6.6	...	4.7	7.5
Philippines	N	23.0	24.0	21.4	19.1
	R	9.8	11.0	8.5	6.5
Republic of Korea . .	N	34.0	35.0	22.4	21.3
	R	28.6	29.8	19.9	18.9
Sri Lanka	N	22.8	18.4	20.4	15.8
	R	16.2	11.9	13.6	9.3
Thailand[b]	N	15.9	16.0	19.2	15.7
	R	15.3	15.5	17.8	14.6

Sources: Country papers prepared for ESCAP special project on energy 1980.

Notes: N=Nominal price.

R=Real price (nominal price deflated by Consumer Price Index (1970=100)).

[a] 1974/75–1979/80.

[b] 1973–1980.

148. As is to be expected, the rates of price increases for super petrol and regular petrol were generally almost identical. Nominal prices for auto-diesel and kerosene increased at slower rates than petrol in Bangladesh, Iran, the Philippines, the Republic of Korea and Sri Lanka but at significantly higher rates in Nepal. In Papua New Guinea price increases for auto-diesel were lower than that for petrol but kerosene prices increased faster than either petrol or auto-diesel; in Thailand, the reverse situation prevailed with kerosene price increases being the lowest and auto-diesel prices being increased more rapidly than that for petrol.

149. These disparate movements in the rate of growth in nominal prices for selected petroleum products have been the result of various factors. Petrol, which is largely used for private passenger transport, recorded the largest rate of nominal price increase (except in Nepal), and, except for Iran and Nepal, such annual average price increases for petrol ranged from about 16 per cent in Papua New Guinea and Thailand to around 35 per cent in the Republic of Korea.

150. Diesel prices rose faster than that of petrol only in Nepal and Thailand. Considering the generally extreme reliance of heavy goods transport, public passenger transport and heavy construction equipment on diesel fuel and the ramifying effects that diesel price increases have on the economy as a whole, the general tendency has been to hold down increases in the prices of diesel fuel. However, it might also be noted that the rapidly increasing tendency towards new investment in diesel engines of all sorts because of economies in operating costs and the narrowing capital costs of diesel vis-à-vis petrol operated vehicles and equipment has, in some developing ESCAP countries, increased the demand for diesel beyond the capacity of domestic refineries. This process has also been further accentuated where the retail prices of petrol and diesel have sharply diverged owing to differential taxes and duties.

151. Only in Nepal and Papua New Guinea did the annual average price increases of kerosene exceed that of petrol; significantly so in Nepal. Kerosene, as the commercial fuel which is widely demanded in the rural areas for cooking and lighting and by the lower-income urban dwellers for cooking has generally been accorded more favourable attention in energy pricing policy for social welfare reasons. However, with the 1973-1974 price increases in petroleum products, some countries which had been subsidizing kerosene prices moved towards removing the subsidy and relatively faster rates of price increases for kerosene are, in those cases, largely due to this factor.

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[35] This is on the assumption that the net retail price corresponds to the landed cost (plus distribution costs) at the prevailing rate of exchange. Further complexities arise if the net retail price itself already reflects other subsidies or taxes.

152. The general trend to hold kerosene prices relatively low has also had to contend with the possibilities for substitution. While kerosene is often relatively lower-priced for social welfare reasons, it can (and is) used to extend diesel fuel for use in internal combustion engines. The dilemma in policy often is that a higher relative price for kerosene will not only directly and adversely affect social welfare but could also lead to further demand for firewood with extremely deleterious effects when deforestation is already proceeding apace.

153. Where real prices[36] are concerned, Bangladesh, Iran, Nepal, Papua New Guinea and the Philippines have had relatively modest price increases ranging from –5.9 per cent for diesel and kerosene in Iran to 11.0 per cent for regular petrol in the Philippines and auto-diesel in Nepal. Bangladesh, where nominal prices increased by 19.9 per cent for auto-diesel and 25.5 per cent for regular petrol, had, in real terms, only relatively low price increases of 4.5 per cent for auto-diesel and 11.0 per cent for regular petrol. So, too, the Philippines, where the apparently large nominal price increases in petroleum products (ranging from 19.1 per cent for kerosene to 24.0 per cent for regular petrol) had, in real terms, only an increase from 6.5 to 11.0 per cent annually.

154. In Sri Lanka, real price increases were (except for kerosene) higher than that in the four countries discussed earlier.

155. The Republic of Korea and Thailand demonstrate significantly high rates of increase in both nominal and real prices: real price increases for petrol were, in the Republic of Korea, almost double that in Thailand.

156. Thus, only in the Republic of Korea and Thailand have the increases in the retail prices of these selected petroleum products kept pace with general price inflation in the domestic economy. In the other six countries, the increases have in varying degree fallen below the rate of general price inflation and thus, in relative terms, cheapened the cost of these petroleum products to the consumer.

157. The data in table 17 on the consumption of selected petroleum products show vividly that the sharp import price increases in petroleum products in 1973-1974 led to an immediate decline in consumption with the lowest levels being recorded during the 1973-1975 period. However, thereafter, general and, often, sharp increases up to 1979 are noted.

158. Considering the trend in consumption from the lowest levels in 1973-1975 to 1979, Iran, the Republic of Korea and Thailand have shown the largest increase in consumption; while Iran, a large oil exporter, had very low real price increases, in the Republic of Korea and Thailand price increases were the highest among the developing ESCAP countries surveyed. Generally, there does not appear to have been any significant relationship between the rate of increase even in the real retail prices of petroleum products and their consumption.

159. The factors affecting energy consumption are many and varied and quantitative account has not been possible of important determining variables such as the distribution of income, type of capital stock, availability of energy substitutes and their price etc.

160. It is, however, significant to note the results of a regression exercise[37] which covered 13 developing ESCAP economies and took account of four[38] explanatory variables to obtain estimates of the income-elasticity of demand for energy and the price-elasticity of demand for energy.

161. The results suggest that the income elasticity of demand for energy was less than unity ($\simeq 0.7$). This estimate is significantly smaller than that suggested in other studies.[39] The differences are explanable in terms of the number of explanatory variables used in the models. The other models have used only *per capita* income or price and income as explanatory variables and, consequently suggest income-elasticities greater than unity. In the model used in this report, too, a similar result (income-elasticity greater than unity) is obtainable if only *per capita* GDP is retained as the explanatory variable.

162. This model suggests that, while income-elasticity is less than unity, energy consumption could increase even with a constant *per capita* GNP if urbanization or the share of industry in GNP increases. Indirect taxes, however, have had a depressing effect on demand.

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[36] The "real price" of energy has been derived as the price of energy relative to the prices of "all other goods" by deflating energy prices by the cost of living index or the consumer price index.

[37] See technical appendix I.

[38] GNP *per capita,* index of industrial output in GNP, percentage of population in urban areas and the index of indirect taxes per unit of consumption expenditure.

[39] See, for example, Government of India, *Working Group on Energy Policy* (New Delhi, 1979); Country Paper: Republic of Korea, Kim Ho Tak, Special Project on Energy, ESCAP, 1980. Other more detailed analyses of the income elasticity of demand for energy in *Economic Studies in Energy Demand and Supply* (Maddala, Chern and Gill, Praeger, 1978); D. H. Nissen and D. H. Knapp, *A Regional Model of Interfuel Substitution* (SIMS Research Application Conference on Energy, ALTA, Utah, July 1975); M. L. Baughman and P. L. Joskow, *Energy Consumption and Fuel Choice by Residential and Commercial Consumers in the U.S.* (Cambridge, Mass. M.I.T., May 1975), report estimates for the developed economies which are significantly below unity.

Table 17. Selected ESCAP countries. Consumption of selected petroleum products, 1970-1979

	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*	*1979*
Kerosene										
Bangladesh	420	293	270	377	327	317	347	343	383	403
Iran	—	—	—	—	68	81	91	102	102	...
Nepal	—	—	—	—	33	32	30	33	34	40
Papua New Guinea	10	12	14	14	15	15	18	19	22	23
Republic of Korea	479	533	467	472	385	628	694	728	1 081	1 433
Sri Lanka	273	269	278	270	213	210	203	210	241	335
Thailand	129	191	268	209	241	206	295	285	266	340
Gasolene										
Bangladesh	72	44	54	65	58	60	55	56	60	66
Iran	—	—	—	—	43	54	68	80	87	96
Nepal	—	—	—	—	10	11	11	11	11	12
Papua New Guinea	67	85	97	97	99	113	114	114	118	120
Republic of Korea	864	992	976	1 041	698	664	838	1 105	1 259	1 372
Sri Lanka	148	138	132	130	95	95	100	110	128	115
Thailand	946	1 269	1 268	1 500	1 606	1 763	1 963	2 183	2 307	2 323
Gas oil										
Bangladesh	—	—	—	—	—	—	—	170	184	204
Iran	—	—	—	—	92	111	129	156	163	148
Nepal	—	—	—	—	24	25	30	33	44	45
Papua New Guinea	—	—	—	—	—	10	8	14	14	13
Republic of Korea	1 775	2 099	2 338	2 838	2 918	3 328	4 103	4 768	5 558	5 915
Sri Lanka	250	250	264	261	235	246	253	258	304	351
Thailand	2 182	2 584	2 714	3 083	2 955	2 867	3 357	3 730	3 926	4 411

Source: Country reports, Special Project on Energy, ESCAP, 1980.

Note: Quantities in thousand metric tons for Bangladesh and Sri Lanka; thousand barrels per day for Iran; thousand kilolitres for Nepal and the Republic of Korea; million litres for Papua New Guinea and Thailand.

163. Over-all, price elasticities are very low and well below unity. Also, over the period 1972 to 1978, price elasticities have gently fallen in the first half of the period and have, thereafter, moved gently upward.

164. The model suggests that increases in energy prices have been associated with price elasticities of well below unity (i.e. that demand is inelastic to price increases) but that decreases in energy prices lead to much larger price elasticities (even above unity).

165. The tentative nature of the results derived from this model needs to be reiterated. However, the hypotheses derivable are important enough to be further investigated at the individual country level because of their direct relevance to domestic price policies.

166. It does seem that the timing of retail price increases in developing ESCAP countries could be further investigated in order that price increases become more effective. In the past, retail price increases in petroleum products appear to have awaited and lagged behind the sudden (and administratively determined) price increases in imported petroleum. The consequent sudden adjustments in domestic retail prices have created real domestic political problems and have made even more difficult the process of adjustment in the economy. Furthermore, with continuing general price inflation, the scenario has been that of "staircase" adjustments in nominal prices while, in real terms, retail prices for petroleum products have declined continuously from one sharp nominal price increase until suddenly being increased at the succeeding nominal price increase.

167. In order to avoid such an unsettling situation, a short-term retail pricing policy for petroleum products and for energy in general could consider the possibility of determining retail prices in relation both to import prices and to the trend in general price increases so as to ensure that the real retail prices of energy products remain, at minimum, con-

stant and, preferably, move gently upward. To the extent that such adjustments are made on a predictable basis, adjustments in the domestic economy to increasing energy prices will be facilitated and further increases necessitated by sudden increases in import prices made less traumatic and politically more acceptable. Such an approach is likely to be more effective and more in consonance with the achievement of longer-term national socio-economic objectives than the disruption which will inevitably result if the oft-practiced alternative of sudden and draconian increases in prices is adopted.

168. Similar considerations could be taken into account in the manner and timing of price adjustments for indigenous energy products as well.

169. Appropriate pricing policies have, no doubt, an important long-term role to play in eliciting additional supplies, in encouraging interfuel substitution and in achieving greater efficiencies in use. However, the contention in this report is that the socio-economic conditions in the developing ESCAP region require that price policy be treated as one of the many instruments in a total policy package and that undue reliance on the price mechanism alone could, in the short term, be counterproductive and disruptive given the market rigidities and the skewed income distributions in most countries.

170. In this respect, too, the objective of maintaining real prices cannot be a rigid and overriding principle of short-term pricing policies for all energy products. In appropriate circumstances, policy formulation will need to give consideration also to social welfare considerations which could require that specific petroleum products (or energy sources generally) are made available either at cost or even subsidized. In the latter case, pricing policy could aim at optimizing the entire petroleum (or energy) price package by cross-subsidization within the system. Such an approach has characterized price policy packages in some developing ESCAP countries and is an approach worthy of continuance in future short-term price policies provided that the financial consequences are explicitly recognized.

171. Apart from being an instrument to encourage reductions in consumption, price policy has been suggested as an appropriate means of (a) achieving interfuel substitution and (b) greater efficiency in use of energy sources.

172. The impact of price policy on interfuel substitution in the short term is likely to be minimal and confined only to a few sectors of the economy, if any, unless disruption of production and large capital expenditures are politically acceptable and economically feasible; such a conclusion appears equally true whether of specific energy sources or of economic sector.

173. A supplementary approach in policy might be not to interfere unduly with input prices through price policies (since the process choice in the short run is often rigid) but to influence final product prices through taxes and subsidies. In other words, fuel economy in the aggregate might be better achieved by fiscal measures which raise the prices of products that have a heavy energy component (both in their manufacture and in their operation) relative to those that do not.

2. Non-price policies

174. The role of non-price policies in economic management in general and in the short term in particular will continue to be a contentious issue. However, the adoption of price policies need not exclude the usefulness of non-price policies and vice versa, and this is particularly true where short-term economic policies in energy are concerned. The suggestion basically is that a judicious mix of various types of policies is more likely to be successful in achieving the multiple objectives which are sought within imperfect market structures, resource constraints and inequalities in the distribution of income and wealth.

175. Since these considerations could vary greatly between economic sectors in the short term, the following sections discuss in greater detail some of the major issues and possibilities in policy formulation.

3. Transport sector

176. Energy consumption in the transport sector in the developing ESCAP region is almost exclusively provided by the primary energy source of petroleum. Substitution by other primary sources of energy — mainly natural gas and by-products of biomass — in the transport sector, even if technically feasible, is likely to be a significant possibility in the short term only in some developing ESCAP countries: Bangladesh and Thailand are planning the use of natural gas while Fiji, Papua New Guinea and the Philippines are developing biomass sources.

177. The major short-term possibility for substitution of fuel sources in the transport sector is that between the by-products of refining petroleum — petrol, diesel, kerosene and LPG (liquefied petroleum gas). "Interfuel" substitution in the transport sector is, thus, qualitatively a different phenomenon from that in other economic sectors where the substitution of primary energy sources is at issue.

178. During the 1970s, most developing ESCAP countries implemented policies aimed at influencing the type of fuel usage in the transport sector by varying relative prices. The most noticeable shift in patterns of fuel usage is that of the relatively larger increase in demand for diesel which seems to be more a consequence of the development process in fishing, logging, heavy freight and construction machinery than any significant shift from petrol- to diesel-powered vehicles. The latter factor could become of greater importance only where new investments in machinery and equipment are influenced by relative prices or where, as has already happened in many countries, public diesel-powered transportation has been increased to accommodate the shift from petrol-powered private transport. Otherwise, there is a considerable inelasticity of demand for petrol arising from the existing stock of petrol-powered vehicles, preference for private transport (also connected to distribution of income), the spatial distribution of housing, commercial areas etc.

179. The attempts to influence the type of fuel usage in the transport sector through relative pricing policies raise fundamental questions in the circumstances of the developing ESCAP countries which already have petroleum refining capacities which are geared to particular varieties of crude oil inputs and to a specific output-mix of refined petroleum products.

180. Policies which induce a shift from one type of refined petroleum product (say, petrol) to another (say, diesel) do not affect the volume of crude oil input required for the output of required volumes of other middle distillates but rather lead either to a situation of excess availability in the product being substituted for (petrol) and, possibly, the need for the importation of the substituting product (diesel).

181. Such circumstances have been faced in some developing ESCAP countries and the need for discriminatory price policies as between petroleum products as well as the actual extent of the price differentials should take into full account the existing and/or anticipated product-mix from domestic refineries.

182. This supply-based criterion for the determination of relative pricing policy for petroleum products would assume even more critical importance in cases where surpluses of particular products are non-exportable in the short term. It could be counter-productive, under such circumstances, deliberately to force the underutilization of existing capital stock in, say, petrol-powered vehicles and to encourage shifts to new investments in diesel-powered vehicles.

183. Apart from the issue of the relative pricing of petrol and diesel in the transport sector, it is clear that wherever the differentials in relative prices become pronounced, the considerable scope for substitution as between the various middle distillate products is encouraged: also between petrol and LPG. Consequently, the absolute and relative levels of their prices needs to be more carefully determined in the light of supply availabilities, product-mix availability, technical substitutability and social welfare considerations.

184. However, it might be emphasized again that this entire exercise of price policy formulation for the transport sector and, generally, for substitution among refined petroleum products is a qualitatively different exercise from price policies aimed at a substitution of one primary energy source for another. Consequently, unless there are other overriding social objectives in the utilization of specific refined petroleum products and/or where the potential to export surpluses of middle distillates exists, social welfare could well be enhanced by the domestic consumption of the entire output of all middle distillates from domestic refineries. Such distillates are the inevitable consequence of producing the required volumes of refined products such as kerosene and diesel, which have social priority. Pricing policy should, then ensure that absolute prices for the various refined petroleum products are determined in relation to the import/production cost and allow for progressive increases in nominal prices to maintain constant or slowly rising real prices in the short term and, possibly, also to raise revenue, while relative prices should be determined basically on the product-mix supply availability where domestic refineries supply the bulk of demand so as to ensure that the more important social needs are satisfied, that unexportable outputs are consumed and that undue substitution is not encouraged. These objectives could well be inconsistent among themselves and will require careful resolution in the context of each individual country.

185. The intent of a price policy would, of course, differ considerably when the potential exists for interfuel substitution (in the real sense of substitution of one primary energy source for another) and, even more specifically, when the substitute is of indigenous origin. Then, price policy will need to take into fuller consideration the impact on sectors of alternative use, the capital expenditures required to make interfuel substitution possible and whether or not the substitute energy source is tradeable in the short term. Such possibilities are, however, limited in the short term to mainly the substitution of indigenous natural gas or biomass products for diesel or petrol and could become a feasible option in the short term in a few developing ESCAP countries if pro-

duction is economic and if the additional capital expenditure for modifying machinery is not excessive.

186. The scope for greater efficiency in fuel use in the transport sector has been proven to be considerable. Given the inelasticity of fuel demands in this sector to prices, many non-price policies have been implemented in the region to restrain consumption, to increase efficiency in use and to influence modes of transport.

187. Higher import duties on imported vehicles and/or increased sales taxes on locally produced vehicles have been generally resorted to. In many instances such levies have been progressively increased on larger cars. Furthermore, as in the Philippines, Singapore, Sri Lanka and Thailand, annual registration and road taxes are progressively higher on larger and/or newer cars. Absolute limitations on the sizes of engines also feature in Sri Lanka (below 1500 cc), in Thailand (below 1800 cc for government cars) and in the Philippines (ban on eight-cylinder engines and only four-cylinder engines in local production).[40]

188. In addition, the potential for much steeper fiscal levies on power-consuming motor accessories (air-conditioners, power steering etc.) could be further exploited.

189. In some countries, such as Singapore, the use of private cars within certain areas of the city was further discouraged by high parking fees and limited access: Sri Lanka also briefly experimented with the measure of banning the use of private vehicles during specified hours on Sundays.

190. Lower speed limits have been declared in some countries and official claims in Thailand are that substantial savings in fuel use will be consequently achieved. In most large cities in the region greater attention is also being paid to improving traffic flows.

191. Pakistan, the Republic of Korea, Sri Lanka and Thailand also decreed the closure of petrol service stations on specified days of the week and during specified hours. The impact of such a measure is difficult to quantify since its direct impact will only be on those consumers who lacked the foresight to stock in advance. The negative impact of such a measure has been felt by public taxis, small freight carriers and productive users of petroleum products. Consequently, such requirements have, in Thailand, been modified to exclude diesel fuel. On the positive side, however, such closure of distributing outlets has a considerable educative and informative value about the gravity of the energy crisis.

192. These measures which are designed to curtail the demand for energy for private transportation and to induce greater efficiency in fuel use in that sector could be all the more effective where alternative modes of transport are provided.

193. The accelerated improvement and extension of public transport facilities has been undertaken in almost every developing ESCAP country: more comfortable public transport in the form of air-conditioned public transport is also available in some countries. In addition, the reservation of road lanes during the rush hours for public passenger transport vehicles, as in Thailand, has greatly speeded the flow of public passenger traffic and is claimed to have significantly lowered the costs of operation (including significant reductions in fuel use).

194. Bicycle lanes in India, Philippines, Sri Lanka and in Thailand are further attempts to encourage alternate forms of private transport.

195. In the case of freight transport, many developing ESCAP countries are accelerating the development of inland and coastal potentials for water transport. Bangladesh, Sri Lanka and Thailand are cases in point. Greater efforts are also being made to divert heavy freight from road to rail.

196. The policy dilemmas are basically twofold: first, where substitution is encouraged (or is possible) between different types of petroleum products, the social costs and benefits of the substitution will need to be very closely examined and, secondly, the more intractable dilemma of whether or not the continued use of relatively fuel-inefficient existing capital stock will be socially more desirable in the short term than idling existing stock and investing in more fuel-efficient stock.

197. The latter factor will almost invariably make for a sharp divergence between social benefits and individual preferences. Patterns of income distribution will have considerable impact on the preferences for private transport. Additionally, too, the life of transport equipment and machinery could span many decades (if so required) and so long as current operating costs are not overwhelmingly large in total operating expenses,[41] individual preferences might be better served by continuing to operate existing capital stock. Curtailment of fuel use could, thus be more amenable to administrative restrictions

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[40] The effect of such restrictions could be diminished if imports by non-nationals are exempted and if such imports were to be freely saleable on the domestic market. Some developing ESCAP countries have specific conditions governing such imports.

[41] Fuel costs normally being 15–20 per cent of total operating costs.

(such as those discussed above) supplemented by quantitative fuel controls provided that adequate alternate modes of mass transport are available.

198. Quantitative rationing of motor fuels was a temporary expedient in some countries during the 1970s because of supply shortages but it is now being considered as a more permanent policy in countries such as Sri Lanka and Thailand. Three variants of a petrol rationing scheme have been canvassed: (a) a rationed entitlement per month available to a specific vehicle, (b) scheme (a) plus the facility of purchasing additional quantities freely at higher prices, and (c) a rationed entitlement per vehicle for a longer-period — six months or one year — with the ration being freely transferable and with no additional supplies being made available.

199. If rationing were envisaged, the latter commends itself on many grounds. Most important, for supply planning purposes, an almost exact estimate of requirements would be available (unlike in scheme (b)). Furthermore, a free market would inevitably develop. If the ration were suppliable only to a specific vehicle, free market transactions would need to be through the physical transfer of fuel with its attendant risks. By scheme (c), the ration entitlement itself would be freely transferable. The grant of ration entitlements for a longer period of time would also enable private consumption to be better planned and, thereby, reduce dependence on the free market for unforeseen needs.

200. Ideally, any such scheme should provide rations only for a single vehicle per family and should have the very minimum of added allowances for those performing "essential" functions. While, as in any scheme of rationing, leakages from government and other large public and private sector users in particular are likely to be considerable, under schemes (a) and (c), this would not affect total supply planning but only result in internal redistribution within the system.

201. Ocean transport presents a different and unique set of circumstances. Given the significant role of international trade in the developing ESCAP region and the consequent reliance on ocean transport, the indirect payments made by these economies for energy consumed in ocean transport is considerable. To the extent that freighters are outside the effective jurisdiction of the developing ESCAP countries, decisions as to fuel use and efficiency in use are determined by global situations and requirements and the effective decision-making authority in this respect vests completely in the operator. To the extent that prices to the consumers could be determined under oligopolistic conditions and to the extent that the service provided is vital to the consumer's economy, the ability to increase prices and pass the incidence of the fuel price increase to the consumers could counterweigh the adoption of more efficient techniques which require additional capital expenditures.

202. For national energy policy to be fully effective, developing ESCAP countries will need to try and ensure that all direct and indirect expenditures on energy by the economy are amenable to national policies. To the extent that the present structure of ocean freight transport does not permit of the direct influence of national priorities, developing ESCAP countries should investigate ways and means by which they could have a direct influence: some possibilities are discussed in chapter VI.

4. Industry

203. The industry sector is a heavy consumer of commercial energy in the developing ESCAP region. The aggregate elasticity of energy consumption with respect to industrial output is declining and, in 1978, was estimated to be well below unity, reflecting perhaps the combined forces of increased energy productivity and conscious energy-saving measures. These forces make it worthwhile looking at the industrial sector for some further relief in the rising demand for energy.

204. It is noted again that the type of interfuel substitution of primary energy sources that has been sought in industry does effectively substitute for the heavier distillates in petroleum refining and, where such products are already in surplus (as an inevitable consequence of obtaining adequate supplies of middle distillates) and are non-tradeable in the short term, the social gain through substitution will, in the short term, need to be very carefully assessed: the social gain will not, anyway, be the value of the entirety of the heavy petroleum distillates substituted for if these are in non-tradeable surplus.[42]

205. The major possibilities for interfuel substitution in industry are in the substitution for petroleum of coal, natural gas, hydroelectricity and to a limited extent, biomass.

206. Yet, except in those few developing ESCAP economies which have already been using coal and natural gas as primary energy sources or have indigenous reserves of natural gas and hydropower which are already under development, the technical

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[42] Even where imports are directly substituted for, the social benefits by substitution will need to take account of the opportunity uses of the substitute energy source.

potential of interfuel substitution in the short term appears minimal — even assuming that any additional capital expenditure for infrastructure development and reprofitting is available.

207. The scope for short-term interfuel substitution in the industry sector was analysed in a very detailed study[43] commissioned by the secretariat "aimed at identifying possible energy substitutes in selected energy using industries and activities of importance to the ESCAP region . . . to provide guidelines to help determine short-term policy options at the level of a process within an industry, open to those developing countries which need to conserve energy or reduce reliance on imported oil". The study limited itself to a planning horizon of up to five years to represent the "short-term". "The assessment procedure used to identify important energy using industries cross-referenced those industries of greatest economic significance to the ESCAP region with measures of the intensity of energy use in each industry sector. The industries selected were sampled from those with the greatest economic significance and the highest measures of energy intensity. Some key industries, e.g. Aluminium, were not selected despite their actual or potential scores of significance and energy-intensity in the region. This was because at least one other industry in a similar category was included, e.g. iron and steel, and repetition of examples from one industry category was not seen to be as valuable as drawing from a wider industry sample. The 11 industry sectors selected for more detailed analysis were as follows:

Industry sector	*ISIC No.*
Food manufacturing	311/2
Textiles	321
Paper and paper products	341
Industrial chemicals manufacturing	351
Other chemicals manufacturing ..	352
Glass and glass products	362
Other non-metallic mineral products (principally cement and clay products)	369
Iron and steel manufacturing	371
Fabricated metal products	381
Electricity generation and supply ..	4101
Transport and storage	71

Preliminary analysis showed that two sectors — Electricity generation and supply (ISIC 4101) and Transport and storage (ISIC 71) — play an important role in the identification of energy substitutes in almost every other industry sector. For this reason, these two sectors were analysed in more detail in the report."[44]

208. The study concludes that "from 11 industry sectors and plethora of different processes and activities within each industry, *relatively few energy substitution possibilities emerge as feasible within the short term* (underlining supplied)" except where indigenous sources of alternate primary energy have been developed to the extent that interfuel substitution becomes feasible given short-term technical feasibility and low additional capital investment requirements.

209. Under these circumstances, the use of the price mechanism to vary the relative costs of alternative energy sources would, in practice, either be ineffective or be counterproductive in impact on output and competitiveness in export.

210. Increases in energy prices relative to that of capital and labour could also, if the technical possibilities existed, (a) lead to the more intensive use of other inputs and a lower input of energy without an increase in the price of the final product, or, if substitution is not feasible, (b) be wholly reflected in the price of the final product, or (c) lead to a decline in energy inputs, no substitution and a decline in output.

211. The first possibility is a complicated process since an increase in energy prices could lead to investment in less energy-intensive capital stock and/or to the greater input of labour and/or to the adoption of energy-saving practices with existing capital stock; the second possibility creates various other problems while the third possibility would generally be undesirable.

212. The specific policy package would need to be carefully determined in the light of the circumstances in each economy: the preliminary conclusions of an econometric analysis of available data for India, the Republic of Korea and Thailand suggests that the elasticity of substitution for energy by capital and labour has been high in the manufacturing industry from 1970 to 1976.[45] The results suggest the potential to regulate energy use by influencing the prices of non-energy inputs rather than by concentrating policy effort only on changes in energy prices.

213. While the results obtained from this exercise should be treated as preliminary, the results are indicative of the type and manner of adjustment in factor substitution and further detailed analysis at the country level could provide important bases for policy.

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[43] Vallentine Laurie and Davies Pty. Ltd., *op. cit.*

[44] *Ibid.*, pp. 2–3.

[45] See technical appendix II.

214. There is, however, much scope for improving the efficiency of energy production and utilization in the short term. The World Bank suggests that "an energy saving programme in industry can save substantial amounts of energy in the short term at relatively little cost. Bank staff experience of energy-intensive subsectors in various developing countries indicates that significant energy savings can be achieved within two or three years by improved management, personnel training in management and "housekeeping", and relatively simple changes and improvements in existing production processes (such as the recovery of by-products, or the installation of co-generation capacity, waste heat boilers, better insulation, better bearings)."[46] In the developing ESCAP region, quite clearly, the exact scope for achieving such efficiencies would be a function of the composition and relative size of the industrial sector, and the availability of the expertise and skilled personnel required.

215. As a general rule, too, the greatest potential for better energy efficiency is to be found in the large-scale and major energy-intensive industries. Yet, as table 18 demonstrates, the potential for significant economies in energy use in industry will be of importance only to a few developing ESCAP countries where such energy-intensive industries exist.[47]

Table 18. Potential savings in energy in selected energy-intensive industries

Industry	*Least developed countries output as percentage of world production*	*Potential savings with existing plant (thousand bpdoe[a] at 1978 production levels)*
Aluminum	8.2	5 – 12
Copper (smelted and refined)	22.8	1 – 4
Steel (crude)	9.1	40 – 100
Cement (clinker)	27.4	60 – 170
Ammonia	15.1	10 – 40
Petroleum refining:		
Distillation	7.4	35 – 70
Cracking	0.7	7 – 15
Pulp and paper	11.8	35 – 90

Source: World Bank, *Energy in the Developing Countries*, p. 61.

Note: [a] bpdoe: barrels per day oil equivalent.

216. In some developing ESCAP countries low-interest loans and tax rebates are being provided for energy-efficient conversions in the industrial sector such as the replacement of inefficient boilers and the development of co-generation systems, the Republic of Korea having the most extensive schemes of this nature. Other measures have included the energy audit systems of the Philippines and the Republic of Korea which require heavy energy users to maintain continuing appraisal of energy use and to report to the central energy authority. The specification of industrial standards of energy use, as in the Philippines, is another means of rationalizing energy use.

5. Power

217. The power sector has also been a substantial consumer of primary energy sources. Natural gas, coal and hydropower have been of importance in only a few developing ESCAP countries while, more generally, petroleum has been the most significant commercial energy source for the generation of electricity.

218. The demand for electricity has been growing rapidly in the region. Except in the case of certain types of generating capacity dependent on petroleum, lengthy time-lags are inevitable in the development of added generating capacities. Consequently, in the short term, the dependence on petroleum as a primary energy source for electricity generation will continue and could further increase if extra capacity has to be developed within the short term. In a few developing ESCAP countries more generating capacity, based on indigenous sources of primary energy have been under construction and will come on-stream during the short term while, in a few other countries, interfuel substitution of indigenous energy sources for petroleum in existing units will result. Such possibilities are limited to those countries where the development of hydropower, coal, natural gas and other indigenous sources has reached an advanced stage.

219. The substitution of indigenous natural gas for petroleum in electricity generation has been deemed technologically feasible and commercially viable in the short term. There are, however, major difficulties foreseen in the substitution of coal for petroleum. The World Bank concludes that "whether an existing oil-fired (electricity) plant should be converted to burn coal is a much more complex issue, which requires a thorough analysis of the power system taking into account, among other things, the shape of the load curve, the number, sizes and types of existing plants and the likely sizes and types of future capacity. The choice also depends on such considerations as the space available for coal handling and storage, the facilities for transporting coal, and the willingness of the authorities to accept the greater environmental problems of coal over oil (or, alternatively, to install expensive equipment to remove sulphur and other pollutants). Assuming

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[46] World Bank, *op. cit.*, p. 60.

[47] While, in those few developing ESCAP countries where a considerable range of such energy-intensive industries exist, the potential for savings in energy, *ceteris paribus*, could be quite considerable, table III–4 does also draw attention to the imperative for immediate action at energy saving in the significant proportion of such industries which are located outside the developing countries.

that these problems can be overcome or tolerated and that the plant will be operated at close to capacity over most of its remaining life, conversion from oil to coal should be considered. At a low level of use, the saving in fuel costs would not recover the incremental cost of the conversion"[48] and further that ". . . gas can replace oil as a generating fuel in all types of thermal plants, with relatively inexpensive modifications. However, . . . the potential for substituting coal is much more limited because of the difficulty of converting existing boilers to coal. Because the economic threshold for steam units is 30 MW, small systems will continue to require imported diesel oil as a fuel, unless hydro resources are available".[49]

220. Furthermore, unless the cost of the additional infrastructure required for the use of coal can be shared with other sectors, the large-scale conversion of existing plants to coal use is deemed uneconomic. Even if such substitution is otherwise possible, due consideration will need be given to ensuring that such substitution does not further aggravate the problems of economically utilizing the surplus of residual fuel oil from domestic refineries.

221. In the power sector, there are, at optimum, unavoidable generating losses (power consumed by the generating source in the course of energy production) of between 1 and 6 per cent of total generation. The optimum engineering estimate of electricity transmission and distribution losses is in the 6 to 8 per cent range.[50] Even allowing for much larger losses (say, 12 per cent) there appears to be scope to increase effective supplies from existing generating capacity by reducing transmission and distribution losses in some developing ESCAP economies. Of the 14 economies for which comparable data are available, only in Hong Kong, Singapore and Tonga were transmission and distribution losses held down to around 12 per cent. To the extent that transmission and distribution conditions in these economies are considerably different from that in the other economies considered, a more feasible level for transmission and distribution losses in this region might be the average losses of around 14 per cent in Malaysia and Sri Lanka. Even at that level (which is significantly higher than the technical optimum of 6-8 per cent) there is potential for increasing effective electricity supplies by lowering distribution and transmission losses in many developing ESCAP countries. Table 19 demonstrates the scope to increase effective supplies of electricity from existing capacities by reducing transmission and distribution losses.

Table 19. Selected ESCAP economies. Estimated additional electricity supply availability through reduction of transmission and distribution losses

	Electricity consumption; annual average growth 1970-1979 (percentage)	*Potential additional availability allowing for 14 per cent transmission and distribution (T & D) losses at 1979 production level (million kWh)*	*Potential additional availability through reduction of T & D losses to 14 per cent (years)*
Bangladesh . . .	5.4	637.26	7.21
Burma	5.5	341.42	8.63
Hong Kong . . .	8.5	—	—
India	6.5	22.27[a]	4.02
Malaysia[b]	9.1	—	—
Mongolia[b] . . .	9.4	242.52	2.4
Nepal	18.5	54.18	1.8
Pakistan	6.9	3 424.52	4.8
Republic of Korea .	15.6	8 390.16	1.9
Samoa[b]	8.6	5.42	2.6
Singapore . . .	11.4	—	—
Sri Lanka . . .	7.1	—	—
Thailand	12.1	1 818.90	2.0
Tonga	7.5	0.69	1.4

Sources: Asian Development Bank, *Key Indicators of Developing Member Countries of ADB*, vol. XI, No. I, April 1980; D. Baljinnyam, "Country paper on Mongolia" (ESCAP, 1980); *World Bank Report, Nepal, No. 833a NEP*, 1975; "Country paper on Nepal" (ESCAP, 1980); *World Bank Report, Pakistan, No. 2953–PAK*; E. Ranasinghe, "Country paper on Sri Lanka" (ESCAP, 1980).

Notes: [a] Billion kWh.

[b] For nine-year period only.

222. While the technical and economic feasibility of reducing electricity transmission and distribution losses in each individual country will vary, even allowing for such losses to amount to 14 per cent of net generation, the potential to meet additional demand for electricity (assumed to grow at the same average rate as during the 1970s), even from the current (1979) rate of output, is considerable in at least four developing ESCAP countries where reductions in transmission and distribution losses to 14 per cent of available supply in 1979 could meet the 1970s trend increase in consumption demand for from 4.0 to 8.6 years into the future.

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[48] World Bank, *op. cit.*, p. 44.

[49] *Ibid.*, p. 64.

[50] Among the major factors making for transmission and distribution losses are the distances over which electricity is transmitted, the voltage at which it is transmitted and losses at substations and distributing points. Non-recorded consumption of electricity through the illegal tapping of electricity mains or because of defective metering systems is suggested as a major cause of losses in many countries and is equivalent to the provision of electricity as a free good to such consumers. The technical and administrative possibilities for reducing or eliminating such illegal consumption should be fully effected in the short term where the extent of such practices will justify the capital expenditures that will be required.

223. It is even more significant that, in at least eight of the 14 economies surveyed, there is very little possibility to cater to continued growth in electricity consumption in the short term purely by reducing transmission and distribution losses unless further, and progressively more difficult efforts are made to cut such losses even below 14 per cent (or the lower levels already achieved). In four of these economies the potential to meet additional short-term demands by reducing losses is almost non-existent at the 14 per cent loss level. The 1.4 to 2.0 year leeway that exists in four other economies and, possibly, even in the apparent 2.4 to 2.6 years potential in two other economies, will not give sufficient leeway to bring on-stream new generating capacity — even of thermal generating stations based on petroleum products.[51]

224. Consequently, even if transmission and distribution losses were reduced, in the short term, to 14 per cent of available supplies of electricity, in 10 of the 14 economies surveyed, this would not make a significant contribution towards meeting increases in demand for electricity in the immediate future.

225. These broad orders of magnitude are clearly subject to many qualifications within each individual country situation. However, wherever possible, the imperative to utilize generated output more fully and effectively needs to be stressed as such a strategy could be less capital-intensive and, possibly, increase effective supplies in a shorter period of time than alternate possibilities.

6. Household and commercial sector

226. The direct energy demands of this sector are for cooking, lighting and temperature conditioning.[52] In the rural areas of the region, biomass provides almost the entirety of the energy demand for cooking and, partly, for lighting as well. Commercial fuel sources such as electricity and petroleum products have become increasingly important sources for lighting while the energy demand for temperature conditioning (cooling) remains insignificant.

227. In the urban areas, however, the demand for energy in the form of electricity mainly for lighting and partly for cooling and for petroleum products (mainly LPG and kerosene) for cooking has continued to increase. Firewood and charcoal, which were the traditional energy sources for cooking, have been progressively substituted for by kerosene, LPG and natural gas. This process has proceeded farthest in those urban areas in the region where considerations of living space, fire security, pollution and rising real incomes have induced the utilization of cleaner-burning and more easily handled fuel substitutes. In some urban areas in the region, it has been suggested that the increasing prices of commercial fuels have induced a reversal to the use of biomass energy sources but, apart from the constraints of urban living conditions, the concurrent increase in the prices of firewood and charcoal would have tempered such a substitution. While the reliance on electricity for cooking even in urban areas is generally minimal, it is the sole energy source for lighting and cooling.

228. Data from available household expenditure surveys provide interesting insights into the demand for fuel and power. Table 20 shows that, on average for all households surveyed, expenditures on fuel and light vary from 3.6 per cent in the Philippines (1971) to 6.1 per cent in the Republic of Korea (1970). Five of the 10 observations vary narrowly from 4.0 to 4.8 per cent; three range from 3.0 to 3.2 per cent and two observations exceed 5.0 per cent.

229. The other component of household expenditures which is of direct relevance to the earlier discussion on the role of energy in the main energy-consuming sectors of the economy is the expenditures on transport and communications. More so than in the case of expenditures on fuel and light, there are wide variations in the proportion of household expenditures on this item — partly due to definitional differences.[53]

230. Table 21 which brings together available data on the pattern of household expenditures, by income groups, on "fuel and light" and "transport and communications" has important relevance to short-term economic policies in the field of energy in these sectors.

231. In all the six economies listed and in all the eight survey results examined the distinct trend is for the proportion of household expenditures on "fuel and light" to decrease from the lower to the higher income classes. This general picture needs to be qualified by two factors. First, because of the problem of including the capital costs of fuel-using household equipment, almost all surveys of household expenditure tend to cover the current

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[51] While electricity supply has been considered in total in this analysis, the real potential to meet future demands by reducing losses and by making greater use of existing production capacities will need a detailed analysis at the individual country level in terms of base and peak load demands and sources of supply etc. The detailed project data required for such analysis are often not available in comparable form.

[52] Except in a few developing ESCAP countries, the demand for energy for the heating of buildings and houses is minimal whereas there has been a rapidly growing demand for cooling purposes.

[53] In some surveys the costs of private transport purchases and running costs are included.

Table 20. Selected ESCAP economies. Average household expenditures on selected items, various years

(Percentage of total household expenditures)

	1965	*1968/69*	*1971*	*1972*	*1973*	*1975*	*1975/76*	*1977*
Hong Kong								
Fuel and light					3.0[a]			
Transport and communications					6.1[a]			
Iran								
Water, fuel and lighting	4.1			4.8				
Transportation				5.3				
India								
Fuel and light					6.0[a]			
Malaysia								
Fuel and power					3.8			
Transport and communications					14.9			
Philippines								
Fuel, light and water			3.6			4.6		
Transport and communications			2.9			3.4		
Pakistan								
Fuel and light			5.3[b]					
Republic of Korea								
Fuel and light			6.1[c]					5.3
Transport and communications			5.0[c]					4.8
Singapore								
Fuel and light				4.4[d]				4.5[e]
Transport and communications				11.3[d]				13.0[e]
Sri Lanka								
Fuel and light					4.2			
Transport and communications					3.4			
Thailand								
Fuel and light		n.a.					4.0	
Transport and communications		6.5					7.5	

Source: National surveys.

Notes: [a] 1973/74.
[b] 1971/72.
[c] 1970.
[d] 1972/73.
[e] 1977/78.

(input) fuel costs only and, secondly, these current costs as recorded for various income classes relate to a varying "basket" of fuel-using equipment. Increasing current costs in the higher income classes thus reflect the progressively greater use of fuel-consuming durables and a larger demand for lighting. To this extent, the proportion of household expenditures spent on "fuel and light" will show an even more dramatic decline in the higher income groups if only their expenditures on fuel-using equipment similar to that of the lowest income groups was considered.

232. A further observation worthy of note is that comparing surveys undertaken both before and after 1973/74 in the Republic of Korea and Singapore there is no change in the relative pattern of household expenditures on fuel and power.

Table 21. Selected ESCAP economies. Average household expenditures on selected items, various years

Hong Kong (1972/74)	400-599	600-799	800-999	1000-1199	1200-1499	1500-1999	2000-2499	2500-2999
A. *Fuel and light*	4.2	3.9	3.6	3.3	3.3	2.9	2.8	2.4
of which: kerosene	2.0	1.3	1.3	1.0	0.9	0.6	0.5	0.4
electricity	1.8	2.0	1.8	1.6	1.7	1.5	1.4	1.2
LPG and other fuels	0.4	0.6	0.5	0.7	0.6	0.7	0.9	0.8
B. *Transport and communications*	4.7	4.9	5.7	5.7	6.1	6.1	6.2	6.8
of which: bus fares	2.6	2.7	3.2	2.9	3.0	2.6	2.4	2.4
taxi fares	0.2	0.3	0.4	0.5	0.6	0.8	0.8	1.1
telephone, telegramme etc.	1.9	1.9	2.1	2.4	2.5	2.7	2.9	3.3

India (1973/74)	0-13	13-15	15-18	18-21	21-24	24-28	28-34	34-43	43-55	55-75	75-100	100-150	150-200	>200
A. *Fuel and light*	8.0	7.7	7.9	7.6	8.6	7.5	7.4	7.3	6.8	6.7	6.1	6.1	4.6	3.8

Pakistan (1971/72)	<50	50-99	100-149	150-199	200-249	250-299	300-399	400-499	500-749	750-999	1000-1499	1500-1999	2000
A. *Fuel and light*	5.9	7.2	6.8	6.1	5.8	5.5	5.1	4.9	4.4	4.1	3.5	3.5	3.1

Republic of Korea (1970)	<11.99	12.00-19.99	20.00-27.99	28.00-35.99	36.00-43.99	44.00-51.99	>62.00
A. *Fuel and light*	9.3	7.7	6.5	5.6	5.3	5.1	4.8
of which: electricity	1.9	1.7	1.5	1.3	1.4	1.4	1.3
fuel and others	7.4	6.0	5.0	4.3	3.9	3.8	3.5
B. *Transport and communications*	3.4	4.5	4.8	4.7	5.4	4.8	6.2

Republic of Korea (1977)	<29.99	30.00-49.99	50.00-69.99	70.00-89.99	90.00-109.99	110.00-129.99	130.00-149.99	150.00-169.99	170.00-189.99	190.00-209.99	210.00-229.99	230.00-249.99	250.00-299.99	300.00-349.99	350.00-399.99	>400.00
A. *Fuel and light*	7.9	7.4	6.5	5.8	5.4	4.9	5.0	4.8	4.7	4.4	4.3	4.7	4.5	4.3	3.8	3.0
of which: electricity	1.3	1.3	1.3	1.2	1.2	1.2	1.3	1.2	1.2	1.1	1.0	1.1	1.1	1.2	0.9	0.9
fuel and others	6.3	6.1	5.2	4.6	4.1	3.7	3.7	3.6	3.5	3.2	3.2	3.6	3.4	3.1	2.8	2.1
B. *Transport and communications*	4.2	4.2	4.4	4.8	5.1	5.0	5.0	5.0	5.1	4.8	5.3	4.5	5.0	4.8	4.6	4.6

Table 21 *(continued)*

	< 300	300-399	400-499	500-599	600-799	800-999	1000-1499	> 1500
Singapore (1972/73)								
A. *Fuel and light*	6.2	5.2	4.9	4.8	4.1	4.0	3.5	3.0
of which: water, electricity, gas	4.4	4.0	3.8	3.8	3.3	3.2	3.0	2.6
other fuel and light	1.8	1.2	1.1	1.0	0.8	0.8	0.5	0.4
B. *Transport and communications*	6.6	8.3	9.0	9.7	11.3	12.3	14.5	16.3
of which: private transport purchase	0.2	0.3	0.2	0.3	0.9	1.1	2.4	2.3
running costs	1.0	1.9	2.0	2.4	3.5	3.7	5.7	7.8
public and other transport	5.2	5.6	6.3	6.3	5.9	6.5	5.3	5.3
postage, telephone and telegramme	0.2	0.5	0.5	0.7	1.0	1.0	1.1	0.9
Singapore (1977/78)								
A. *Fuel and light*	8.7	7.5	6.7	6.1	5.3	4.6	4.1	3.1
of which: water, electricity, gas	7.0	6.1	5.7	5.2	4.6	4.0	3.6	2.8
other fuel and light	1.7	1.4	1.0	0.9	0.7	0.6	0.5	0.3
B. *Transport and communications*	6.8	7.5	9.0	9.5	9.8	11.5	12.4	17.6
of which: private transport purchase	—	0.1	—	0.2	0.1	0.6	0.8	5.7
running costs	0.7	1.0	1.9	2.0	2.0	2.8	4.2	6.6
public and other transport	5.4	5.5	5.5	5.8	6.0	6.4	6.0	4.3
postage, telephone and telegramme	0.7	0.9	1.6	1.5	1.7	1.7	1.4	1.0

	<50	51-100	101-200	201-400	401-800	801-1600	1601-2000	2001-3000	>3000
Sri Lanka (1973)									
A. *Fuel and light*	4.0	6.3	5.6	5.4	4.5	4.1	3.1	2.0	2.4
B. *Transport and communications*	3.6	0.9	1.6	2.0	2.6	4.0	5.5	4.4	11.9

Source: National surveys.

Notes: Income classes in national currencies (Republic of Korea, thousands). Expenditures on selected items as percentage of total household expenditures.

233. The implications for energy policies which impinge on the household consumption of fuel and light are far-reaching. Quite clearly any increase in fuel and light prices would be most regressive in their impact unless adequate differentiation in prices (by income or consumer group) were built into the system. This would be particularly pronounced in the case of kerosene and electricity since they are the major energy sources supplying the essential commercial energy needs of the lower-income classes, particularly in the urban areas.

234. Many developing ESCAP countries have differentiated rate structures for electricity depending on amount consumed and category of consumer. Such rate structures do weigh in favour of the lowest-income classes by providing electricity at rates below that charged the larger household consumer. The unanswered question often is whether such a differentiated rate for the lower-income consumers is to be deemed appropriate, in social welfare terms, unless even such differentiated rates are determined specifically in relation to the real incomes of the lower-income consumers.

235. Given the social welfare objectives of the developing ESCAP countries, consideration could be given to more detailed analyses at the national level to determine more closely the structure of fuel prices and power rates for household consumption by specifically determining them with reference to the real incomes of the lowest-income consumers while concurrently ensuring that the total pricing structure for electricity is not only progressive with regard to its impact on different income groups but also that it generates total revenues that would make the subsector (or the entire system) economically viable.

236. The problems with the household consumption of other energy sources are somewhat more complicated in that substitution could play a greater role while there are also greater difficulties in differentiating prices by consumer group. Kerosene is the major energy source demanded for cooking purposes. While for the lower-income groups, kerosene is an essential fuel (biomass apart) for cooking in the urban areas, the ease of substitution of kerosene for other fuels by higher-income groups and for other purposes when relative prices change in favour of kerosene makes reliance difficult on pricing policy alone.

237. One possibility will be to provide kerosene freely at prices appropriate to the needs of the low-income consumers and to adjust the prices of other petroleum products (or all other energy products) in such a manner so that the entire system is in consonance with socio-economic objectives. However, such a policy will not only provide subsidies to the higher-income groups but also will encourage the diversion of kerosene supplies to uses other than cooking (extending diesel fuel, for example). Where domestic refining capacity cannot meet even existing demand for kerosene import requirements will also increase. However, if the price of kerosene is determined purely on commercial considerations, the regressive effect of such a policy will impinge hardest on the lower-income classes.

238. Consequently, if social welfare objectives are to be realized, consideration will need to be given to appropriate forms by which adequate quantities of kerosene could be channelled to the lowest-income groups at appropriate prices. While ideally the prices of other energy sources should be adjusted to make the entire system financially viable, the possibility that social welfare could be enhanced, in real terms, by energy subsectors or even the energy sector as a whole operating at a financial loss must be recognized.

239. Generally, where the fuel and light expenditures of the household and commercial sector are concerned, much greater attention could be given to the use of fiscal measures discriminately to affect the prices of durable energy-using equipment used by different income groups to influence, thereby, the pattern of energy use in total and by source. However, given the relatively long periods of service that energy-using durables such as refrigerators, cookers etc. could be expected to provide, the impact in the short term would not be significant, but such a policy could be an essential element of short-term policy which is supportive of longer-term objectives. In addition, such fiscal measures could induce appropriate industrial restructuring over a period of time.

240. Particularly in the urban areas of the developing ESCAP region, the structure of household and commercial buildings is relatively energy-intensive and very much could be done in the short term to amend building codes and regulations to ensure that new buildings are considerably more energy-efficient. Concurrently, too, energy efficiency in existing households and commercial buildings could be increased by appropriate pricing policies, administrative requirements and by wider publicity of the need for and the methods available for greater energy efficiency. Comprehensive action in these fields has already been initiated in many developing ESCAP countries and, in particular, the Republic of Korea.

241. In the case of household expenditures on transport (which includes expenditures on communications in many surveys) the available data are often not disaggregated enough to make multi-

country comparisons. This is especially so in the case of expenditures on private transport which pose basic conceptual and statistical problems in expenditure surveys.

242. The importance of transport and communications in a modern (or modernizing) society can hardly be overestimated. The facility for mobility and communications is indispensable under such circumstances and the investment in and growth of these sectors have been striking in every developing ESCAP country. The major problem that has now to be addressed is that a spatial distribution of households, public services, commercial facilities, transport modes and the like which had evolved under a regime of relatively cheap energy has come under immediate and serious strain consequent on sharply increased relative prices for energy.

243. The observed proportion of household expenditures for these services is, indeed, very unexpected — often being equal to or even more than expenditures on fuel and light. Consequently, short-term economic policies in the field of energy which will impinge on these areas are deserving of considerably greater attention in design and implementation than appears to have been the case.

244. The most obvious target of policies to induce greater conservation (and/or substitution to socially more beneficial modes) has been private passenger transport. Increases in petrol prices, higher taxes on the import and maintenance of private passenger vehicles, restrictions on usage, controls and/or higher levies for parking or access facilities have all been implemented, in greater or less degree, during the 1970s. However, as discussed earlier, the trend in the consumption of petrol has continued upward and so, generally, have the numbers in vehicular fleets (see table 22) except where administrative restrictions have reduced the rate of growth.

Table 22. Selected ESCAP economies. Vehicles in use, 1973 and 1976

(Thousands)

		Four-plus wheels				*Number of cars per thousand persons*	*Two wheelers*	*Increase percentage*
		Cars	*Increase percentage*	*Others*[a]	*Increase percentage*			
Hong Kong	1973	136.6		42.0		32.4	24.2	
	1976	121.5	—11.1	47.0	11.9	27.3	22.2	—8.3
India	1973	724.4		492.9		1.26	900.5	
	1976	799.5	10.4	537.2	9.0	1.33 (1975)	1 244.0	38.1
Malaysia[b]	1973	316.9		79.4		32.1	507.1	
	1976	412.7	30.2	111.3	40.2	38.5	830.8	63.8
Nepal	1973	8.8		5.1		0.76	5.7	
	1976	11.5	30.7	7.3	43.1	0.94	8.6	50.9
Sri Lanka	1973	89.9		46.5		6.7	22.0	
	1976	93.8	4.3	51.8	11.4	6.7	23.4	6.4
Thailand	1973	250.7		201.0		6.3	408.2	
	1976	363.1	44.8	294.3	46.4	8.3	471.1	15.4

Source: *World Road Statistics; 1972–1976* (International Road Federation, 1977).

Notes: [a] Excluding tractors.

[b] Peninsular Malaysia only.

245. The continued inelasticity of demand for private passenger transport and the relatively high proportion of household expenditures for transport and communications suggest a much closer analysis, at the country level, of the underlying causes for this phenomenon, to ensure that effective and equitable policies are implemented. The short-term approach to the problem would, anyway, have to take full cognizance of, and accept the position that, enormous difficulties and disruption will accompany any effort (even if politically and economically feasible) drastically to change the existing spatial distribution of households, commercial and government buildings. Alternatively, the possibility and the feasibility of providing adequate public transport modes to cater to the existing spatial pattern will need to be carefully weighed as against the alternative of selectively utilizing the available stock of private passenger transport.

246. With policies in most developing ESCAP countries encouraging the shift from private to public transport, much greater attention will need to be paid to ensuring that the public transport services are efficiently run. Average household expenditures on bus fares are a significant part of total expenditures, particularly in the low-income classes, and every effort needs to be made to restrain fare increases by increasing efficiencies in operation. The history of State-owned public transport systems in this region has often not been a happy one and the continued subsidy of inefficiency in such services could be detrimental to over-all social welfare.

247. In some countries, like the Philippines, Sri Lanka and Thailand, both the State and the private sector are involved in public road passenger transport. The exact institutional framework will necessarily vary as between countries although the guiding principle of providing the lowest-cost service should remain the same. Innovations such as bus lanes on main roads, air-conditioned buses, better passenger facilities on railways and their co-ordination with public road passenger services, extension of public transport passenger routes, higher tolls on private passenger traffic on long-distance routes and in congested urban areas etc. have been adopted in some countries and could ease the desired transition from private to public transport facilities.

248. Mass transit facilities have been inaugurated in Hong Kong, and are being implemented in a limited manner in the Philippines and its feasibility for Singapore has been rigorously studied. The initial capital costs of mass transit schemes are high and their suitability for other densely populated urban centres in the region will need to be closely investigated against other alternatives. In the short term, the more promising potential would appear to be in obtaining greater efficiency in energy use by relatively small investments which could enable maximum utilization of the existing infrastructure for the transport of both passengers and freight while achieving the maximum possible efficiency in energy use.

249. The energy-use inefficiencies inherent in the widespread use of household electric water-pumps in many urban centres to compensate for inadequate pressure in the public water distribution systems are indicative of further possibilities of achieving greater efficiencies in energy use.

7. Agriculture

250. Though the agricultural sector is generally the largest sector in the economies of the region in terms of output and employment, it consumes only about 5 per cent of total commercial energy. It is, however, the largest consumer of non-commercial energy largely for rural cooking purposes.

251. The plans for agricultural development in the developing ESCAP region will significantly increase demands for commercial energy consequent on the strategies of encouraging greater mechanization in agricultural processes and agro-industries. Such possible trends raise a number of issues which include the appropriateness of anticipated strategies in the context of the changed energy situation, the type and end-use of particular energy sources and the pricing and availability of energy and capital for agricultural development.

252. Energy-intensive development strategies, whether in agriculture or in other sectors, will need to be carefully reconsidered in relation to over-all energy availabilities and national objectives. In the specific case of the agricultural sector, too, the over-all guiding principle will need to be the achievement of greater energy efficiency and the substitution of indigenous energy for imported energy. Concurrently, too, attention will need to be focused on the better utilization of available capital stock in the sector and changes in institutional structure required to achieve these objectives.

253. The pricing of energy for agricultural purposes will be a complex exercise which will, inevitably, be overlaid by socio-political considerations. Even within these constraints, short-term economic policies will need to ensure better utilization of capital stock (tractor pools etc.), substitution of energy sources (biomass energy sources, greater utilization of animal power etc.), and the most economic use of energy (electricity instead of petroleum products, public irrigation schemes, alternate transport modes etc.). Very specific attention might also need to be given to a re-examination of policies which have lowered the costs of mechanization and, thereby, led to the substitution of more traditional means of production.

B. SHORT-TERM MANAGEMENT OF ENERGY SUPPLY

254. The overriding objective of energy supply management in the developing ESCAP economies had been to ensure that energy supplies continuously and rapidly increased to enable accelerated development and modernization. Such a "rapid growth in energy consumption will be not only a necessary concomitant of industrialization"[54] but also an absolute necessity if the socio-economic objectives of the developing ESCAP countries are to be achieved. The need to increase total energy supplies should,

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[54] *World Development Report* (World Bank, 1978), p. 22.

thus, continue to be given primary attention in policy. The suggestion that modifications in life-styles should be the main issue will be misplaced priority since, "it may be possible to reduce the gravity of the Third World's energy problem by suggesting modifications in life-style such as the renunciation of private cars and the consumption of meat; but (whatever happens in practice) it is hardly realistic to suppose that such a prescription will be any more politically acceptable in the developing world than it would be in a western society".[55] To the extent that the immediate crisis in energy supply basically evolves around the supply and the price of imported energy, the fact that the developing countries account for only a relatively small proportion of internationally traded supplies and also have much less flexibility to increase supplies might well suggest that the prescription of modifying life-styles should more appropriately be directed at the more affluent and larger consumers of the available world supply of non-renewable energy sources.

255. The development of indigenous energy sources has certainly been given a sudden impetus by the increases in petroleum prices in the 1970s. However, except in a few instances such as the accelerated exploitation of indigenous natural gas, the development of indigenous fuel sources holds out promise only in the longer term. In the short term such programmes pose greater problems of resource allocation in developing countries where development is already constrained by a shortage of investible resources. In addition, all forms of primary energy are not freely substitutable and, in the short term at least, there are no immediately feasible alternative energy sources which could significantly substitute for and match the ease of transport, handling and flexibility in use of petroleum nor satisfactorily substitute for the secondary energy source of electricity in all its applications.

256. Petroleum imports in the developing ESCAP region provide about 75 per cent of commercial energy supplies and this ratio rises sharply if oil producers in the region are excluded. In effect, then, almost the entire "modern" sector in most developing ESCAP countries is almost totally dependent on petroleum imports except to the extent that an alternative source of primary energy such as hydroelectricity, natural gas or coal provides some part of energy supplies.

257. Given the existing levels of economically viable technology in new and renewable sources of energy, significant increases in energy supplies from such sources is likely to be realized only in the long term except in a few developing ESCAP countries where natural endowments have speeded development.

1. Non-renewable energy sources

258. Petroleum, coal and natural gas sources have already been developed in some countries of the region and it has been suggested that there is considerable potential for the exploitation of such resources in the developing ESCAP region.

259. However, increasing energy supplies from non-renewable sources is both capital-intensive and subject to considerable time lags. Consequently, the potential to increase indigenous supplies of non-renewable energy sources will be extremely limited in the short term except where development projects have already far advanced in implementation. Also, as has already been discussed, not all forms of primary energy sources would be readily usable in the short term. Additional supplies of coal, even if possible in the short term, would, thus, be less immediately usable than increased supplies of indigenous natural gas or petroleum.

260. In most developing ESCAP countries, therefore, the imperative in the management of energy supply is, in the short term, to implement speedily policies which could accelerate work on the identification and development of indigenous non-renewable energy sources which could be brought on-stream in the longer term.

261. Given the very limited, or even non-existent, possibilities to increase indigenous supplies of non-renewable energy sources in the short term in most developing ESCAP countries, the major concentration of effort in short-term policies for the management of energy supply will need to be in assuring the supplies of non-renewable energy sources in appropriate form.

262. The assurance of the supply of imported petroleum and its products[56] will be crucial for continued development in the region in, at least, the short term. Exports from the members of OPEC, and particularly the Middle East, will remain the dominant force in the trade in petroleum for the foreseeable future. The developing ESCAP countries have had a historical dependence on petroleum supplies from the Middle East. By 1977, the dependence for crude oil supplies from the Middle East was 100 per cent in Pakistan, the Republic of Korea and Sri Lanka while in Malaysia and the Philippines the dependency had

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[55] C. Baron, "Energy, development and basic needs: the employment and other social implications of energy scarcity in developing countries" (Rotterdam, 1980) (mimeo.).

[56] Chapter VI considers some interregional possibilities in this field.

increased from that in 1970; in India, Singapore and Thailand the dependency on the Middle East declined from 1970 to 1977 with regional supplies now providing 23 per cent and 13 per cent respectively of total crude petroleum imports, in the latter two countries and the centrally-planned economies 12 per cent in the former. Supplies from the centrally-planned economies, though still relatively small, have grown in importance in the Philippines and Thailand as well.

263. However, for these eight countries as a whole, the dependence on the Middle East for crude petroleum supplies increased from 82 per cent in 1970 to 87 per cent in 1977. Iran, Kuwait and Saudi Arabia were the largest suppliers from the Middle East with Saudi Arabia supplying over one half in 1977.

264. With a view to assuring petroleum supplies, many developing ESCAP countries have partly diversified their supply sources after 1977 or have been forced to do so consequent on recent developments in the Middle East.

265. Instances of such supply diversification include the accords for increased supplies from China, Indonesia and Malaysia to the Philippines and Thailand and from Eastern Europe to India.

266. However, storage facilities are generally inadequate in most developing ESCAP countries to meet any extended disruption of petroleum imports mainly because of the capital costs of storage (both for storage infrastructure and for holding stocks). The Republic of Korea and Thailand, for instance, have moved towards temporary reliance on floating tanker storage but, more generally, the trend seems to be towards the diversification of import sources and bilateral agreements for emergency supplies.

267. Short-term economic policy will need to firm national contingency plans against unforeseen energy shortages. This will be a more complex exercise than the rationing of some refined petroleum products as envisaged in some countries since contingency plans will need to consider possible supply shortages in total and in various energy sources and to be able immediately to implement policies which could maintain economic growth with minimal possible impact on social welfare.

268. The other major problem in the short-term management of energy supply is in the assurance of the supply of particular forms of non-renewable energy sources. This has become a growing problem particularly in the case of various refined petroleum products.

269. With increased prices for petroleum products, often accompanied by changes in their relative prices, there has been a growing problem in managing the supply of light and heavy distillates so as to meet changing demands. The demand for light distillates such as diesel, kerosene and petrol has generally increased while heavy fuel oils have become increasingly in surplus in national refineries.

270. There is considerable rigidity in the output mix of refineries and large imbalances between supply and demand for particular petroleum products can, and have, arisen with changes in demand. Such a situation is compounded by the inability of most small refineries to convert the surplus heavy fuel oil into lighter products without installing cracking facilities at considerable capital cost, Sri Lanka has decided to do so.

271. This growing imbalance between refinery output mix and demand is being accentuated by petroleum replacement programmes in many developing ESCAP countries where the development of indigenous energy sources such as coal, natural gas and hydroelectricity effectively reduces demand for fuel oil (which is already in surplus) rather than the demand for the light distillates (which has been increasing). This has been particularly true of petroleum replacement programmes for electricity generation. The management of the supply of particular petroleum products is a complex issue since it necessitates the optimum balancing of objectives such as the need to reduce consumption, to increase revenue, to contain or reduce over-all price inflation, to encourage interfuel substitution etc. Difficult situations in this regard have already been faced by some countries (like Sri Lanka) where, for example, sharp increases in retail prices led to large unsaleable surpluses of petrol at the refinery. Where such surpluses are effectively "non-tradeables" in the short term, consideration could be given to pricing policies which could enable the domestic consumption of such products where the alternatives are costly storage or disposal at uneconomic prices on the export market.[57]

2. Renewable energy sources

272. Where indigenous renewable energy sources such as biomass and hydropower are concerned, the major factor making for seasonal disruptions in supply availability is the vagary of weather. The effects of climatic uncertainties is further compounded in multipurpose projects which also generate hydroelectricity as the water impounded at the dam

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[57] The major constraint to the export of surplus petroleum products is the non-availability of shipping for the uplift of sporadic and relatively small quantities.

has to cater to agricultural needs as well. Such situations make for difficulties in domestic policies in having to decide as between alternative priorities and, most often, the dilemma has been resolved by even greater reliance for electricity supplies on thermal generation based on imported petroleum. A by-product of these climatic uncertainties has also been the tendency to build reserve thermal capacity largely to meet such eventualities.

273. The maximum exploitation of indigenous sources specifically for power generation and for other energy sector requirements could be given greater priority in policy. This is particularly apposite in the development of hydropower resources since the demand for electricity has been increasing and is likely to continue to increase. Because of the long time-lags in hydropower development, maximum emphasis will need to be given in the short term to the identification and appraisal of likely sites and, comparative costs permitting, to the implementation of appropriate policies which would encourage the maximum substitution and utilization of hydroelectricity in the economy.

274. There seems to be potential to increase hydroelectricity supplies in the short term in a few projects in the developing ESCAP region by relatively small investments in increasing storage dam heights and/or by supplementing an existing catchment area by the diversion of additional water supplies. While such possibilities do exist, they have unfortunately too often not received as much attention as more spectacular, more capital-intensive projects of longer gestation.

275. The development of mini hydro plants to meet regional needs within countries and/or to supplement national requirements has excited considerable interest as a possibility to augment short-term supplies. However, the capital costs of installed capacity per kWh of generation in mini hydro plants are significantly larger[58] than in alternative modes of generation though the total outlay is relatively smaller. Consequently, the development of mini hydro plants is more likely to be a feasible proposition to meet very specific regional needs rather than to provide a significant addition to short-term total supplies.

276. The possibilities for the substitution of some part of imported petroleum products by indigenous, renewable sources of energy have been deemed feasible in a few developing ESCAP countries. While the technical feasibilities for increasing energy supplies from renewable sources have been demonstrated, the socio-economic and financial constraints are still to be satisfactorily resolved in most countries. The increased supply of energy supplies based on biomass sources could, for example, make demands for the diversion of arable land which would pose major policy dilemmas in food-deficit or densely populated countries. Social, cultural and institutional constraints have also, in many instances, precluded any significant increases in energy supplies from renewable energy sources.

277. While there are short-term inelasticities in the supply of biomass energy sources, short-term supply management policies will need to pay much greater attention to the development of such renewable energy sources both in the short term and to their role in the longer term.

278. A vastly expanded programme for the dissemination of information about the possibilities for generating energy supplies from biomass sources at the household or communal level should be undertaken in the short term along with programmes to provide the required capital funds. Where socio-cultural factors obstruct the utilization of biomass sources for increasing energy supplies at the household level, the extension of public sector activity into this field should be urgently considered.

279. The vast majority of the people in the developing ESCAP region are at present dependent on biomass sources of energy and urgent action is called for to increase such energy supplies as, otherwise, the short-term problems of managing commercial energy supplies will also be gravely compounded because of the possibility for substitution.

280. Apart from the better utilization of existing biomass to increase energy supplies, the potential in the many quick-growing varieties of trees to provide increased supplies of firewood in the short term should be immediately exploited. At present, firewood is in effect a non-renewable resource as increasing exploitation has outstripped the natural regeneration of supplies: except marginally, firewood is considered a "free good" in its exploitation and use. While the attempts to encourage the development of household and communal woodlot holdings could be further intensified, a rapid and significant increase in firewood supplies might well necessitate well-managed, large-scale public or private woodlots of quick-growing varieties of trees. Such a development will, in effect, commercialize the production and sale of firewood and, consequently, will impinge on the rural areas where firewood has hitherto been a non-commercial energy source: consequently, these possibilities might have to be developed in tandem rather than as alternatives.

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[58] World Bank, *op. cit.*, p. 43.

C. OVERVIEW

281. This section briefly recapitulates, and expands further on, some of the major short-term economic policy options which have been suggested in, or by, the preceding sections.

282. Short-term economic policies in the field of energy will need to take for granted the fact that petroleum and its products will continue to remain an indispensable source of energy during the immediate future. While in a few developing ESCAP countries alternate sources of primary energy such as coal, natural gas and hydroelectricity could gain in relative importance, no significant change in the dependence on petroleum could be anticipated in the short term in most oil-importing developing countries of the region. Even given progress in the better utilization of petroleum and other primary energy sources, a decline in the absolute quantities of energy being currently utilized does not seem to be a feasible possibility without affecting economic growth. An absolute decline in the usage of imported petroleum could, however, result in those countries where indigenous energy substitutes could be brought on-stream in the short term: natural gas in Bangladesh, Pakistan and Thailand, geothermal energy in the Philippines, alcohol from biomass in Papua New Guinea and the Philippines, hydroelectricity and coal in some countries offer possibilities in this respect.[59]

283. The other overriding consideration in short-term economic policies in the field of energy has to be a more explicit acceptance of the unique nature of energy in the economy. Policy-mixes in the field of energy will differ very widely in content depending on whether energy is treated as just another commodity or whether energy is treated as being as important as land, labour and capital in the production process.

284. With regard to the two issues highlighted above, the explicit contention in this report is that (a) short-term economic policy should continue to encourage the more efficient consumption of increasing amounts of energy in developing ESCAP economies, (b) that all economic policies should explicitly take account of energy considerations, and (c) that energy policies should be framed with recognition of their ramifying effects throughout the economy and the attendant consequences for national socio-economic objectives.

285. The need for developing ESCAP countries to exploit indigenous sources of energy more rapidly can hardly be overstressed. The short-term policy framework in this regard will need to encourage concurrently the identification and accelerated development of indigenous energy resources, the better use of existing energy production capacities and the substitution, where economic, of indigenous for imported energy sources.

286. In a few developing ESCAP countries, indigenous energy sources have already been developed to the stage where such sources could be brought on-stream during the short term. Even in such cases, policy makers will need to consider very carefully the rate of exploitation of indigenous non-renewable sources and the end-use to which such sources are put. Interfuel substitution of indigenous for imported sources of energy should not be considered, *ipso facto,* socially beneficial and developing ESCAP countries could pay much greater attention to the opportunity cost of the manner of utilization of indigenous energy sources. Where natural gas is concerned, for example, Afghanistan and Malaysia[60] have tended towards exploiting its potential as an export commodity, Pakistan and, to a lesser extent, Bangladesh have given greater priority to the use of natural gas as an industrial input (even when natural gas could have substituted for imported petroleum) while the primary initial use in Thailand will be to substitute for petroleum in electricity generation.

287. The more general short-term picture in the developing ESCAP region is that policy will need to concentrate on the better utilization of existing energy production facilities, the more effective use of available supplies in the context of the continued, if not increased, dependence on imported energy sources. Consequently, short-term economic policy in the field of energy should be explicitly concerned about energy supply availability and energy end-use.

288. The potential to achieve greater efficiencies in energy use is accepted as being significant. However, the problem in the short term continues to be that of the rigidities imposed by an existing capital stock and the additional capital expenditures that will be required to effect significant increases in energy-use efficiency. No general prescription for policy formulation appears feasible except that developing ESCAP countries will need to take immediate steps to increase efficiency of energy use at least in those sectors where this could be achieved without extensive capital requirements, and without declines in physical outputs. The important policy dilemma

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[59] It might again be stressed that while such indigenous energy sources may provide increases to total energy available, yet, they might not substitute for the varied uses of petroleum in the existing stock of capital.

[60] There has been a growing sentiment, of late, in Malaysia that indigenous natural gas should be used only for industrial processing.

of whether the existing stock of energy-using machinery and equipment should be underutilized in favour of more energy-efficient capital stock poses enormous financial and political problems in the short term and will need to be carefully resolved at the individual sector (or, even, project) level within countries.

289. The most difficult, yet inescapable, consideration that short-term energy policies have to contend with is that the distribution and pricing of energy raises serious social welfare and equity problems. As discussed earlier, the price elasticity of demand for energy is invariably very low and a significant proportion of household expenditure in the lower-income groups is on fuel and light. The ability to sustain even these essential needs for energy will be sorely affected unless real incomes were rapidly increasing or unless price policies are discriminatory enough not to be unduly regressive in effect.

290. The social desirability of over-all price policies in the short term is further questionable since structural rigidities and resource endowments preclude higher prices (over-all or relative) from inducing larger energy supplies, developing alternate energy sources or even achieving any significant interfuel substitution. In most developing ESCAP countries, too, the responsibility for assuring total energy supplies and for the development of alternative energy sources is invariably totally in the hands of the national Government and, consequently, the need for price policies to achieve these objectives is superfluous unless the very limited perspective of considering the financial status and viability of individual energy sectors (or projects) were adopted. Given the strategic importance of energy in the economy, it could more appropriately be argued that the financial viability (or even optimum loss) of the entire energy sector should be considered rather than energy subsectors or individual energy projects.

291. Where non-renewable (non-petroleum) indigenous energy sources are concerned, policy will need take careful account of the alternative uses possible. So, too, when the output-mix of domestic refineries consists of surplus refined products which could be considered relatviely non-essential in a social sense but which are non-tradeable in the short term. In such circumstances, there is a social loss through the disposal of this surplus at uneconomic prices or its continued storage. This situation could arise and has arisen, in the case of petrol and a similar situation arises when fuel oils (which are in non-tradeable surplus) are sought to be substituted for with alternate indigenous sources of energy.

292. Where domestic petroleum refining capacity is available (and its continued operation deemed socially desirable) the short-term output-mix of the refinery could provide the guidelines for determining levels of consumption of various refined products. The major exceptions to this guiding principle would be (a) when refined products of importance for social welfare (e.g. kerosene) are in inadequate supply from domestic refining capacity and imported supplies become socially desirable; (b) when non-essential products (e.g. petrol) could be traded on the world market at economic prices and/or (c) when the socially most beneficial utilization of indigenous energy sources will be their substitution for petroleum products in surplus from domestic refining which could be traded on the international market at economic prices.

293. A basically supply-determined, demand management policy package seems to offer the prospect of greater immediacy in impact, greater predictability in the results anticipated from policy and for the achievement of social welfare objectives.

294. In the short term, the effectiveness of price policies will be gravely distorted by the imperfect market structures and skewed income distributions that characterize the developing ESCAP economies. If income distribution and standards of living are not to widen further within countries, quantitative restrictions on consumption, fiscal levies on energy-using products, administrative requirements in patterns of energy use, dissemination of possibilities and methods for more efficient energy utilization etc. would need to form the essence of short-term energy policies. Concurrently, energy efficiency standards should be determined and all energy-using machinery and equipment should clearly indicate their energy efficiency.

295. In the transport sector, for example, many developing ESCAP countries have implemented varied policies to induce a more socially desirable utilization of energy. Petrol-powered private passenger vehicles, for example, have been subject to sharply higher import duties and other taxes, to administrative controls over their production or import and to steeply graduated annual road or registration taxes to constrain ownership and use of such vehicles and to encourage the use of smaller fuel-efficient vehicles or public transport. Road tolls, restricted access and high parking charges have also formed part of such non-price policies.

296. Even when supplemented by much higher retail prices for petrol, the effectiveness of such policies has remained low. Consequently, the rationing of petrol has been increasingly considered in many developing ESCAP countries. In this respect, the

possibility of providing freely transferable petrol-ration entitlements determined basically on total supply availability from domestic refining capacity could be investigated: new additions to vehicle stock could be provided with smaller ration entitlements. If adequate public transport facilities are provided, the free transferability of ration entitlements could provide a direct financial incentive to curb the utilization of private passenger transport in favour of public transport.

297. Similar policies seem to commend themselves where socially more desirable forms of freight transport are already available to substitute for more fuel-expensive means.

298. The dilemma in all such instances (which is common to all economic sectors) is to determine the social desirability of whether to make the best use of the existing capital stock which is relatively fuel-inefficient or to substitute new machinery and equipment which is more fuel-efficient. This dilemma is a very real one when total investible resources (or even only foreign resources) are in short supply and further highlights the importance of considering the energy problem as an integral part of over-all national planning and policy formulation.

299. Diesel fuel and kerosene present more complex problems because of the possibilities for substitution, because of social welfare considerations and because of their importance in construction, fishing and other productive activities. Where supply is limited (or needs to be limited), policies will need to ensure that adequate quantities are available at appropriate prices for socially desirable purposes: the possibility of marginal intersectoral transfers of entitlements should not preclude the adoption of quantitative allocations under such circumstances.

300. In the industry sector, direct incentives for the use of more fuel-efficient methods and equipment by the provision of low-interest loans, tax rebates etc. deserve greater consideration in policy formulation. Concurrently, too, direct disincentives through fiscal policies could form part of the same policy package to discourage the production of fuel-inefficient products or socially less-essential energy-consuming products. Such policies impinging on the final product rather than production inputs alone could be more immediately effective on both consumption and industrial restructuring.

301. The rapid increase in demand for the secondary energy source of electricity needs separate policy consideration because of its unique characteristics. Household and commercial demand is a very significant component of total demand for electricity and this demand component is likely to grow rapidly by the very fact of greater urbanization and modernization while the demand for electricity from the industrial sector will be conditioned more by the availability and relative prices of electricity.

302. Electricity is less amenable to quantitative controls and, consequently, primary reliance will need be placed on the price mechanism to regulate total demand and, to assure equitable distribution of the available supply.

303. Most developing ESCAP countries have differentiated electricity rates depending on the amount of consumption, the purpose of consumption and, sometimes, on the geographical region within the country where electricity is consumed. Such differentiated electricity tariffs might need to be further refined in order to ensure that (a) the electricity system as a whole is financially viable (or the energy system as a whole is viable in social terms), (b) that adequate supplies are provided to the lower-income groups at prices related to their real incomes, and (c) that the tariff structure sharply escalates to discourage undue consumption.

304. The need for short-term policies to emphasize the electrification of the rural, agricultural areas can hardly be over-emphasized. Given that electricity would, in these areas, be used almost entirely for lighting and productive purposes, the availability of electricity could lead to the substitution of mainly imported commercial sources of energy such as refined petroleum products. Even where the electricity generating system is partly dependent on petroleum inputs and even where additional generation might be significantly dependent on petroleum sources, the possibility and the feasibility of expanding electricity supplies to the rural areas could be more rigorously examined.[61]

305. Particularly in the urban areas, there is significant scope to increase efficiency in the use of electricity and to curtail non-essential consumption. Differentiated tariffs could be the base upon which more direct non-price regulatory measures could be implemented. In some countries of the region, such measures have included the closure of places of entertainment and television stations during peak-load hours, restrictions on outdoor advertising signs etc.

306. Apart from the need for electricity for lighting and productive purposes in the rural areas, the

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[61] In the case of Pakistan, the availability of electricity was the crucial factor, even without any change in the relative prices, in its substitution for light diesel oil in lift irrigation and for kerosene for lighting. The cost factor was overriding in that the capital costs of diesel tubewells was double that of electric tubewells while the operating costs of the latter were one half of the former. See Masood Ahmed, *op. cit.*

assurance of adequate biomass sources for cooking purposes is vital if the demand for kerosene is not to continue to increase. There is adequate information available on quick-growing varieties of trees which could provide added supplies in the short term. The development of biogas as an alternative source of energy supply is another promising short-term possibility although, in both cases, much greater attention will need be given to identifying and adjusting to the socio-cultural constraints that now seem to be hindering further progress along these lines. Where woodlots and biogas digesters are not feasible on an individual household or even communal basis, the possibility of their development on a governmental basis as part of the over-all energy sector could be fruitfully and immediately pursued. Such an approach might also commend itself in the utilization of the biomass waste emanating from existing industrial processes.

307. Given the overwhelming demand for energy for cooking in the rural areas, priority attention could be given in short-term policy to the development and the distribution of fuel-efficient stoves to enable the more efficient use of available biomass supplies. The energy needs of the rural population have tended to be generally neglected in most national energy policies in favour of the more articulate demands of the urban population. To the extent that there is growing pressure on the traditional sources of energy in the rural areas, greater substitution by commercial sources of energy will increasingly impinge on total energy availability in the economy and, consequently, is worthy of more immediate attention.

308. Finally, the importance of generating a greater awareness of the growing problem of energy and of the methods by which greater efficiency in use can be achieved must be reflected in short-term policies. Publicity and propaganda campaigns should form important supplements to the more visually apparent compulsory energy conservation programmes affecting television, entertainment, advertising, government and commercial consumption.

IV. ENERGY PLANNING AND ITS IMPLEMENTATION

309. The preceding chapter discussed some of the complexities in the formulation of short-term energy policies.

310. As already discussed, the main concern in energy policy prior to the oil price increases of 1973-1974 was to assure adequate supplies of cheap energy to meet the needs of accelerated socio-economic development.

311. This relatively simple policy exercise of adjusting supply to anticipated demand was adequate in itself in an era when imported oil supplies were freely available at stable and relatively low prices. The lack of proper appreciation of the importance of comprehensive energy planning during this era is, thus, not surprising since there was hardly a scarcity value attached to energy products. Energy planning, consequently, remained an incidental exercise in national planning and policy formulation except where the development of indigenous energy sources were given an impetus as an exercise in import substitution.

312. Technical and financial considerations became, thereby, the main determinants in energy planning. The evaluation of alternative energy project possibilities tended to assume the constancy of petroleum prices and, even if slight increases in petroleum prices were allowed for, energy projects based on petroleum invariably commended themselves on financial criteria and the comparative technical ease of bringing them on-stream.

313. The recent increases in the prices of petroleum products has had ramifying effects throughout the economies of developing ESCAP countries and has, in particular, greatly affected production costs in the industrial sector, which has been a leading sector in the drive for accelerated socio-economic development.

314. The years 1973-1974 could, in effect, be considered to form a watershed after which the price and availability of energy have become significant constraints on world production, consumption and trade. This realization and its translation into effective policy was not immediate partly because of the relative ease with which developed and developing countries alike adjusted to the changed situation. However, the continuing increases in petroleum prices pose considerable short-term problems while the depletion of oil reserves makes for longer-term uncertainties about future production and trade. With no major expansion, in the immediate past, of exploration activities for new energy sources nor major investments in alternatives such as coal, synthetic fuels or nuclear power, and in view of the high investment cost and long lead times of such alternatvies, new energy sources are not expected to become available in large enough quantities to significantly replace oil as a primary energy source before the twenty-first century.

315. Economic development both at the national and the international levels has, thus, to take a new approach which more explicitly takes account of the role of energy. Such a restructuring of development strategy is a daunting, yet inescapable, task for development economists at the national level and a challenge which will have to be constructively resolved through international co-operation. The resolution of this problem will inevitably entail a large-scale reallocation of resources, both nationally and internationally, and consequently require bold policy changes covering prices, tariffs, subsidies, taxes, financial policies, consumption patterns and life styles, a more rational consumption of non-renewable energy resources and a more economic location of world productive capacity.

316. While this report has drawn specific attention to the short-term aspects of the energy problem, it is necessary that this be done within the longer-term perspective to ensure that short-term policies do not detract from the longer-term objectives. Particularly in the case of energy the longer-term perspective becomes crucial because of the depletion of known energy reserves, the possible discovery of new reserves, the impact of technological progress, substitutability between energy sources and the long gestation period for new energy supplies. The manner of perception of these factors could, by themselves, change the approaches to policy-making and appraisal in the short term.

A. INTEGRATED NATIONAL ENERGY POLICY

317. Uncertainties in the supply and price of energy and the ramifying effects that such uncertainties could have on the economy as a whole make the formulation of integrated national energy policies a complex exercise which will require a much deeper insight and understanding of the energy sector and its interactions with the total economic environment than has hitherto been generally available. Decisions will need to be made between alternative strategies for energy development which will imply commit-

ment, under conditions of grave uncertainty, to energy projects which will not come on-stream for five to 10 years.

318. In order that informed decisions be made on such complex issues there is the paramount need to improve, and make more comprehensive, existing systems of data collection and analysis. Some critical areas worthy of immediate attention are (a) more comprehensive data on the supply and demand for various energy sources, (b) patterns of energy use in different income classes, their changes over time, reactions to prices etc., (c) detailed estimates of sectoral consumption and needs, (d) the time horizon of potential indigenous supplies, (e) the investment costs of alternative forms of energy, (f) better information on the production and use of energy-consuming consumer goods etc. Data are especially lacking on non-commercial energy sources and an immediate effort will need to be made to rectify this deficiency.

319. An integrated national energy policy will need to proceed through the integration of energy subsector policies and through their integration with policies geared towards the achievement of social-economic objectives.

B. INTEGRATION OF ENERGY SUBSECTOR POLICIES

320. In most developing ESCAP countries, the prevailing approach to pricing, financing, planning and conserving energy is largely determined on energy subsector (petroleum, coal, electricity etc.) considerations without adequate attention being paid to intersectoral relationships and the possible trade-off between investments in energy and alternative investments. Consequently, there could be the grave possibility that allocations to energy subsectors and to specific projects within subsectors have not taken adequate cognizance of the intersectoral relative costs and benefits.

321. Energy plans are thus, most often, no more than a summation of individual investment programmes rather than a structure of allocations determined by the optimum possibilities for the development of the energy sector as a whole in the light of long-term anticipations of supply and demand.

322. The integration of energy subsectors based on the cost-benefit evaluation of alternative possibilities for energy development not only within a subsector but also across subsectors will be an essential precondition to ensure an optimum allocation of resources which could provide adequate supplies of energy at least cost and in the specific energy form required.

323. Given the long lead times required both to assure energy supplies in appropriate form and to restructure energy demands, an optimum energy mix would need to be achieved progressively over a series of successive planning periods wherein alternative supply-demand options would be considered over the short, medium and long term. Such an approach will retain the flexibility required to adapt to the uncertainties in the supply of non-renewable sources of energy and the promise of technological advances.

C. INTEGRATION OF ENERGY POLICY AND SOCIO-ECONOMIC POLICY

324. The demand for energy is a derived demand and, as such, the level and structure of energy consumption depends on the structure and growth of the entire economy. Consequently, the energy policy goals of achieving an optimum energy mix and energy conservation by moving from an oil-based, energy-intensive to an energy source-mixed, energy-conserving economy will be dependent on appropriate demand management policies in the consuming sectors (industry, transportation, residential/commercial etc.). The energy implications of alternative development strategies in the consuming sectors would, thus, need to be properly appraised and made consistent with over-all energy policy and socio-economic policy as a whole.

325. Such an appraisal at the consuming sector level could involve, *inter alia*, the appraisal of the trade-offs between greater energy efficiency and the additional capital expenditures required to achieve this, between interfuel substitution and the capital costs of conversion and between the adoption of energy-intensive technologies at lower capital cost than higher cost, more fuel-efficient technologies.

326. These dilemmas are greatest in the short term when the economy has already invested in particular forms of capital stock and where the difficult decision is whether or not to underutilize (or idle) existing energy-intensive capital stock and whether or not to substitute new investment in less energy-intensive capital stock. Where capital and foreign exchange is scarce (as in the developing ESCAP countries) this dilemma in the short term is very real and, apart from determining the optimum composition of additions to capital stock, policy will need carefully to determine the relative costs and benefits of such alternative possibilities. Such an evaluation should provide the vital base for policy formulation although quite clearly social and political realities could considerably change the scope of the policy as finally implemented.

327. However, even such short-term considerations will need to be catered to in a manner which will be least disruptive of the longer-term necessity that energy-efficiency be maximized on an economy-wide basis. For that objective to be achieved the output mix of the economy will need to be changed and final demand and producers' purchases redirected away from energy and energy-intensive goods. The role that fiscal measures (rather than input prices alone) could play in such a transformation of the economic structure needs be stressed again.

328. The reformulation of existing policies to achieve changes in inputs and in the final demand mix would involve significant costs and benefits to social welfare through the restructuring of production, income and consumption patterns. Consequently, too, the imperative that even an integrated energy policy should be in consonance with over-all socio-economic policy and the inevitability that social, cultural and political considerations could modify purely economic desirability. While the latter forces are an important part of the reality in policy formulation and implementation, the importance of being aware of the costs of such modifications to policies suggested by purely economic considerations should be borne in mind.

D. NATIONAL ENERGY ADMINISTRATION

329. The formulation of an integrated energy policy and its further integration with over-all national socio-economic policy could require significant changes in the existing structure for policy making and administration in the developing ESCAP region.

330. With the pervasive role played by energy in the economy, almost every ministry and department in the existing structure of government is involved, to a greater or lesser extent, in making decisions which impinge on national energy policy.

331. Many developing ESCAP countries have established a central energy authority at ministerial level to formulate and evaluate the administration of national energy policies.

332. Such functions have been vested in the Ministry of Industry in Burma, in the ministerial level State Energy Commission in China, in the Ministry of Mines and Energy in Indonesia, in the Ministry of Oil in Iran, in the Ministry of Electricity and Mines in Nepal, in the Ministry of Energy in the Philippines, in the Ministry of Energy and Resources in the Republic of Korea, in the Ministry of Trade and Industry in Singapore, in the Ministry of Power and Energy in Sri Lanka and in the Ministry of Energy, Science and Technology in Thailand.

333. In some other developing ESCAP countries, responsibilities for energy matters have been functionally divided between ministries such as between the Ministry of Water and Power and the Ministry of Mines and Industries in Afghanistan, between the Ministry of Power, Flood Control and Water Resources and the Ministry of Petrol and Mineral Resources in Bangladesh, between the Ministry of Petroleum and Chemicals, Ministry of Energy and the Ministry of Atomic Power in India, between the Ministry of Energy, Telecommunications and Posts, the Ministry of Primary Industry and the Ministry of Trade in Malaysia and between the Ministry of Petroleum and Natural Resources and the Ministry of Water and Power in Pakistan.

334. The immediate political and administrative constraints on the proper functioning of such energy authorities have, understandably, been many. The major constraints have been the lack of adequate background data and knowledge for energy planning and investment co-ordination, the shortage of multi-disciplinary staff required for such an exercise, the difficulties faced in dealing with the vested interests of an established administrative framework and the consequent problems of co-ordination.

335. Better co-ordination in energy matters has also been sought through other institutional arrangements such as the Energy Study and Planning Cell of the Planning Commission in Bangladesh, the Energy Sub-Committee of the Cabinet in India, the inter-ministerial body (BAKAREN) in Indonesia, the Cabinet Committee on Energy in Malaysia, the National Energy Planning Council in Papua New Guinea, the inter-ministerial Energy Co-ordinating Committee in Singapore, the National Energy Commission in Sri Lanka and the National Energy Commission (of the National Economic and Social Development Board) in Thailand.

336. Responsibilities for planning and developing specific energy sectors are delegated to public corporations and government departments in most countries. This is particularly evident in the development of indigenous energy sources and in the generation and distribution of electricity.

337. The need for a central organization to deal with all aspects of energy planning and management is unexceptionable. The specific form of such an organization and the functions and powers allotted will vary as between individual countries depending on the political will to restructure the existing structure. However, at a very minimum, a central energy organization will need to subsume all public sector energy-producing units and energy research institutes be the central point for the collection, analysis and dissemination of energy-related data and be directly

involved in decision making on energy-related matters falling within the ambit of other administrative units.

338. The desirability for close co-ordination between the central energy unit and the other administrative and policy-making branches of government is obvious. A possible administrative arrangement to achieve such co-ordination would be to have specific sections in each administrative unit dealing with energy matters and which are directly linked to the central energy authority. Past experience with such arrangements has not been very satisfactory. The crucial determinant appears to be the degree of authority and influence that the central energy organization itself could wield and this is contingent on the support that is forthcoming from the highest political authority in the country. Whatever the administrative mechanism for co-ordination, the system should enable better management by the central authority over various energy sources and uses and thereby enhance the efficiency of quantitative planning[62] which will need to be the keynote of energy planning.

339. The intersectoral, interdisciplinary nature of energy policy formulation and management does argue for its closest integration with over-all national planning. This might be critical to ensure that energy is built in very explicitly into national economic planning and, thereby, ensure that sector policies and even individual project evaluations take energy intensity and type of energy use as major considerations.

340. The fusion of the central energy authority with the national economic planning organization could be an effective means of achieving the cross-sectoral direction, co-ordination and management that is sought: this would crucially depend on the extent to which the national planning organization itself can play an effective, rather than purely advisory, role in national policy making and management.

341. Centralized decision making, policy formulation and management appear essential for effective energy management. This will inevitably require greater direction over the structure of production and the patterns of consumption. In most developing ESCAP countries, Governments already play a major role in the energy sector either directly through ownership of energy supply facilities and/or indirectly through control over energy prices. In the short term at least, the considerations already discussed in this report argue convincingly for greater governmental direction in ensuring the better integration of policies so as to achieve national socio-economic objectives.[63]

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[62] It has been noted that price planning is most inefficient for those inputs where shortfalls can create large social losses: this would be nowhere as pronounced as in energy and its operational implications will need to be fully reflected in national energy planning and administration. M. Weitzman, "Prices versus quantities", *Review of Economic Studies* (Edinburgh), 1974.

[63] A further consideration is that social cost-benefit analysis in the energy sector has to take account of complex externalities. The major problem is in reflecting the needs and preferences of the future. The introduction of such elements could only be made through the instrument of the state as a representative of the future. Georgescu – Roegen, *Energy and Economic Myths* (New York, Pergamon, 1976).

V. ENERGY PROBLEMS OF SOUTH PACIFIC ISLAND COUNTRIES

A. DEMANDS FOR ENERGY

342. It is easy to appreciate that a basic demand for energy by the 13 countries of the South Pacific relates to their needs for transportation, external and internal. The land area for their 5 million people is half a million square kilometres, about as large as Thailand, but spread over a vast area of ocean which comprises more than a quarter of the world's surface. These countries are, accordingly, widely distant from one another and still more from the major markets for their imports and exports.

343. Fiji, near the geographical centre of the South Pacific, is about 2,300 kms east of Papua New Guinea, 2,600 kms west of French Polynesia, 1,800 kms south of Kiribati, 2,100 kms north of New Zealand and 3,200 kms north-east of Sydney. These countries, moreover, include or comprise small island communities which are themselves separated by big stretches of ocean. Kiribati's four island groups extend over 320,000 square kilometres of ocean although they have only 55,000 people. Tonga, to take another example, has three island groups with a land area of 671 square kilometres spread over 317,000 square kilometres of ocean.

344. It is true that over half this subregion's people live in the world's largest island which Papua New Guinea shares with Indonesia's West Irian. But Papua New Guinea also includes the Bismarck Archipelago, Manus Island and the northern Solomons. It has severe problems of internal transport on the main island where a mountainous terrain and the unsuitability of the swampy coastal areas for native agriculture have led to most of the people living in small upland villages, separated from each other by steep and densely-wooded ranges. Even the few towns are small — Port Moresby, the capital, has less than 100,000 inhabitants — and distances between them are considerable.

345. Sailing craft and canoes still make some contribution to inter-island and internal needs for transport, but most of these needs have long come to be served by powered vessels, motor vehicles or aircraft. The internal as well as the external trade of island countries thus depends largely on adequate supplies of petroleum products, all of which must be imported.

346. In Fiji it has recently been estimated that such products supply 44 per cent of all energy consumed and 94 per cent of the commercial energy. Over half goes to transport, 41 per cent to ground transport, 10 per cent to domestic marine transport and 1 per cent to domestic air transport. In the eastern Pacific, French Polynesia is almost entirely dependent on petroleum products for energy, as are most other island countries. Three quarters of them go to transport, in the proportion of 40 per cent for internal and 60 per cent for international transport, and the remaining quarter to generate electricity.

347. Small, scattered markets and associated transport difficulties have been important factors in retarding the islands' industrial development. Fiji is the most economically developed of these countries[64] but manufacturing contributes only 11 per cent of its GDP; in Papua New Guinea the proportion is 8 per cent and much lower or negligible in the smaller island countries. About 22 per cent of Fiji's petroleum imports go to industry and provide about 20 per cent of all the power it uses; this last proportion is exceptionally low because Fijian industry gets 65 per cent of its power from bagasse (the refuse products in sugar milling) and 10 per cent from wood. In Papua New Guinea neither wood nor hydroelectricity makes more than a small contribution to industrial energy, and wood only for generating steam in timber mills. There, as in the other island countries, industry and transport are both almost wholly reliant upon imported petroleum products for their motive power.

348. Industry, however, in the above classification of energy use, seems to include forestry, fishing and perhaps also agriculture. Two of the smaller Melanesian countries have provided a fuller breakdown of total energy use:

Percentage to	*Solomon Islands*	*Vanuatu*
Domestic	2	25
Agriculture and forestry	16	3
Fishing	21	28
Industry	7	4
Transport	36	30
Commerce and services	7	1
Bunkers and others	11	8

349. The two percentages for transport are comparable with those found for Fiji and Papua New Guinea. The higher proportion in the Solomon

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[64] Apart, perhaps, from New Caledonia, which is heavily dependent on mining and processing nickel ore.

Islands for agriculture and forestry would reflect the greater importance of its timber industry. The two proportions for fishing are, as might be expected, high and not too different. Low proportions for "industry" would reflect the two countries' small manufacturing activity. The proportion of energy to household uses reported in the Solomon Islands is well below that reported in other island countries, probably because of differences in interpreting non-commercial sources of energy or in measuring them.

350. In Fiji, 21 per cent of the total energy consumed is said to go to household uses, three quarters of this being firewood. The only complete study of energy consumption made in Papua New Guinea is for the port of Lae, where 11 per cent goes to domestic uses. Over the whole country wood is supposed to provide 39 per cent of total energy, and nine tenths of this wood is thought to be used in rural areas. Rural electrification is insignificant in Papua New Guinea, but villagers, besides using accessible firewood, are turning now to kerosene for cooking and also lighting purposes. Even in Lae, electric power is less used by households than either firewood or kerosene. In energy terms, subsistence households used four times as much wood as kerosene, low-income households used them in equal proportions, and high-income households used no kerosene but 94 per cent of the electricity supplied to households.

B. SOURCES OF ENERGY

351. At present the only indigenous sources of energy used in the island countries are solar heat for drying copra, wind for driving sailing vessels, firewood or bagasse for cooking or generating steam power and water for hydroelectric generation. It is usual to ignore solar heat and wind power unless they are transformed by some appliance, such as a solar collector or a windmill, into a controllable form of energy. In largely subsistence communities, wood is not usually regarded as a commercial source of energy.

352. Five island countries have estimated the current energy which they derive from wood or, in the case of Fiji, wood and bagasse. These have then been added to contributions from commercial energy to get totals for energy supplies.

353. Fiji's exceptional position has already been noted in regard to indigenous sources of energy. Sugar milling is an important industry there, contributing about one fifth to GDP and well over one half to exports. Its by-product, bagasse, is used by the sugar mills to generate steam and electricity so that, in view of their economic importance in Fiji, bagasse provides nearly a third of its total energy consumption. Firewood provides a fifth of this consumption, and it is estimated that 62 per cent of firewood is used for rural cooking, 27 per cent for copra drying or other rural uses, 8 per cent for urban cooking and 3 per cent for school meals or earthen ovens. Coal has to be imported and is used only for making cement; it is thus a minor source of Fiji's energy supply. Petroleum products have also to be wholly imported and provide 44 per cent of the supply, a low proportion among island countries due to the exceptional role of bagasse.

354. Papua New Guinea and Vanuatu both record substantial contributions to their energy supplies from firewood. It is used for cooking, especially in rural areas, and for drying copra and cacao. Coconut husks and shells are similarly used. In Papua New Guinea 90 per cent of firewood is used in villages and, as has been mentioned, wood wastes are used to generate steam power in timber mills. This country derives a surprisingly low proportion of its energy from hydroelectric power, less than 3 per cent, and thermal plants have twice the installed capacity of hydrostations, but most of the thermal power is supplied to the copper mine at Bougainville which alone accounts for one third of total petroleum imports. The remaining electricity is nearly all used in urban areas as rural electrification has yet to make more than a token beginning. Some electric power is also generated by hydro-plants in New Caledonia and Samoa, but again far more is generated by plants using imported diesel fuel.

355. In the remaining island countries the whole of the commercial energy supply comes from imported petroleum products. Cook Islands, Kiribati and Tonga may illustrate the position of the smaller island countries in this respect. On a volume basis, aviation fuels make up 57 per cent of petroleum imports in Cook Islands, 1.6 per cent in Tonga and 14 per cent in Kiribati. Motor spirit is 17 per cent in Cook Islands, 11 per cent in Kiribati and 25 per cent in Tonga. The percentages for diesel fuel are 25 per cent in Cook Islands, 11 per cent in Kiribati and 43 per cent in Tonga. Kerosene, mainly important for domestic cooking and lighting, is 28 per cent of the total import of petroleum products in Tonga, 4.4 per cent in Kiribati, and only 1.2 per cent in Cook Islands where electricity is heavily subsidized and liquid petroleum gas is replacing kerosene for cooking.

356. Countries having a major energy-intensive industry usually receive their imports of fuel oils as direct shipments in large tankers from a refinery at Singapore. Sometimes these shipments are made to

a company; e.g. Fiji Sugar Corporation in Fiji, the Nauru Phosphate Commission, the Societé Le Nickel in New Caledonia or Bougainville Copper Limited in Papua New Guinea. Fiji and New Caledonia act as the main re-exporting ports to the other islands but some oil is shipped to Solomon Islands via Papua New Guinea. The islands to which these re-exports of oil are sent are generally lacking in facilities for handling large tankers and, in any case, their individual demands are too small for economic deliveries by such tankers. They rely, accordingly, on regular calls by a group of small tankers (1,725 to 3,000 dwt). All oil deliveries, however, large or small, are controlled by a few oil companies which negotiate separate contracts of considerable complexity with their clients.

C. POTENTIALITIES

357. Only in Papua New Guinea do there seem to be reasonable prospects of discovering and exploiting substantial deposits of natural gas or oil, and no island country has found signs of coal deposits. Niue, however, may have some hope of finding uranium because an exceptionally radioactive soil has prompted initial exploration. For the greater part, island countries' hopes of substituting indigenous for imported sources of energy relate to renewable forms of energy — energy derived from rivers or tides, from plants or waste products and from winds or insolation.

358. The most obvious possibilities on the high islands might seem to be hydroelectric power and the substitution of wood as a fuel for thermal power plants. New Caledonia is considering village electrification by making use of waterfalls on its east coast and investigating the feasibility of a wood-fired plant to provide energy to the island of Lifou. Samoa also plans to extend hydroelectric generation while recognizing a need for supplementary measures during the dry season when river flows shrink; it, too, is considering the use of wood fuel for generating electricity. In Papua New Guinea, four minor and three major hydroelectric schemes are under construction, while four other major schemes are under feasibility study, to meet future growth of demand for electricity and to begin a policy of replacing thermal stations gradually. In Fiji, two stages of a major hydroelectric scheme are under development and a third stage planned.

359. Papua New Guinea, however, is giving more consideration to biomass sources of energy largely on grounds of cost. The possibilities here include the following:

(*a*) Pyrolysis of sawmill and forestry wastes: i.e. their thermal degradation into oil, gas or char. Estimates suggest that pyrolitic fuels can be marketed in Papua New Guinea at about half the cost of petroleum fuels, and that the energy potential from present forestry wastes exceeds that of its 1976 imports of petroleum. The first project here is a pilot plant at Lae for producing fuel oil from 3 tons of oven-dried sawmill wastes per day.

(*b*) Combustion of such other waste products as paper, cardboard, coffee husks and used oil. This material would be directly substituted for fuel oil in steam boilers and its potential contribution might be one fifth of petroleum imports.

(*c*) An inferior possibility to pyrolysis of wood waste is to convert it into charcoal, now used for drying tea and a desirable fuel for producing cement. Charcoal is also used as a major domestic fuel in urban areas and can be used to make producer gas which can be burnt in ordinary internal combustion engines. It can also be an extender of diesel oil if mixed with that oil.

(*d*) Biogas from pig manure, coffee pulp waste, sewage and nightsoil is being produced efficiently in large digesters (10,000 to 100,000 gallons), and used for motor vehicles, cooking, refrigeration, pumping or generating electricity. The residue from this process also provides a useful fertilizer.

(*e*) Power alcohol, ethanol or methanol, can be produced from plant materials which have a high content of cellulose or sugar. Cassava is well-suited for this purpose in Papua New Guinea, and use could also be made there of sago and nipa palms. Alcohol fuels can be valuable extenders of petrol and still more so of diesel fuel. Palm oils are also compatible with the requirements of diesel engines when blended in a similar way to ethanol with petrol.

360. There is an advanced project under a new national Energy Development Company to farm cassava in the Western Highlands as the major input for an ethanol plant with the capacity to produce 2 million litres a year. The ethanol is to be blended with gasolene for distribution in the Highlands region where it will be used in special alcohol-powered government fleet vehicles.

361. Some biogas projects have also been undertaken in Tonga and they are being considered for electricity generation in the outer islands of Cook Islands. But in Solomon Islands, although biogas digesters could be developed there might be popular resistance to them as using sewage-type materials; such resistance is also found in Niue. In the atolls and some low islands, lack of vegetation would prevent their development.

362. Greater attention is being paid in such islands to solar power, wind power and perhaps also ocean power associated with tidal energy or thermal differentials of the ocean's layers. In Tuvalu abundant insolation is already used for charging batteries of telecommunication centres and for limited domestic heating. It is hoped to add solar heaters for domestic water and for distilling sea water so as to supplement inadequate supplies of fresh water. Tidal power is vast but far too expensive as yet for a small country to harness. Wind power could be used for pumping water and supplying household electricity. Similar use of solar power is made in most other island countries, and some of them are also considering how to extend its use as well as that of windmills.

363. In the urban areas of Papua New Guinea solar collectors can now substitute economically for electricity in heating water up to 50°C. Such low-grade heating in restaurants, hotels and foodshops accounts for about 10 per cent of total energy use, and to this must be added water heating in homes. Industry demand for low-grade heat is small but there are promising developments which may lead to solar generation of steam at 150°C to 300°C. Solar collectors can also help in regard to air conditioning and refrigeration. Photovoltaic cells are already used in Papua New Guinea, as in other island countries, for telecommunication stations but their cost has been so high as to justify their use mainly in remote areas. That situation, it is thought, may change as recent work in the United States promises to make photovoltaic generation competitive even in urban areas; installation costs are high but there is little need for maintenance over a life of more than 20 years.

364. It is clear that planners in Papua New Guinea have a considerable optimism about the country's possibility of becoming more self-sufficient in regard to energy, mainly by developing hydroelectric and biomass sources but also by having a useful contribution from solar collectors and photovoltaic generators. Their country may be particularly favoured in these respects because of its rivers, abundant land and vegetation, and favourable insolation. If these possibilities prove real, and economic, other island countries could also benefit from their exploitation, although not all are so well-placed to benefit from them as Papua New Guinea appears to be. Biomass exploitation requires abundant plant material or animal refuse, and can be retarded by cultural prejudice. Insolation may be impaired by cloud or haze, as in Kiribati.

365. The high islands have much the better prospects for biomass production of energy. The neighbouring Solomon Islands have similar conditions to Papua New Guinea in regard to vegetation and insolation. Vanuatu claims to have a high potential for charcoal, producer gas, methane or power alcohol. Fiji, too, has a good potential for biomass energy because of its abundant scope for producing sugar and cassava. Samoa, Cook Islands and the Marquesas group of French Polynesia could also have sufficient vegetation for biomass conversions.

D. POLICY MEASURES

366. Nevertheless the immediate problems of energy are urgent in all Pacific island countries and the long-term problems of the less favoured among them quite daunting. Even Fiji and Papua New Guinea which have reason for some long-term optimism about possibilities of exploiting indigenous resources of energy, face serious interim problems in regard to energy supplies.

367. The Fiji Planning Office has considered it conservative to assume, over the next five years, that if petroleum imports decrease by 1.4 per cent a year in volume and increase by 10 per cent a year in real price, the effect would be to increase the constant dollar cost of petroleum imports, even excluding bunkers and aviation fuels, from $F 63 million to $F 95 million. This would be a very heavy strain on the country as it would increase the cost of petroleum imports from 29 to 43 per cent of 1979 export income. If current projects for increasing the output of hydroelectric power and for establishing production of ethanol succeed, the volume of petroleum imports might be held constant up to 1985, but this is thought to be unlikely. At present there are controls at both wholesale and retail level on the prices of petroleum products and the Fuel Controller has used his powers over distribution to restrict trading hours at service stations; energy conservation and exhortations to the public for co-operation in regard to it.

368. In Papua New Guinea three scenarios have been sketched for energy demands up to the year 2000:

(*a*) If there is no growth in *per capita* consumption of energy then the volume of petroleum imports could have a two- to threefold increase;

(*b*) If, as is more likely, the *per capita* consumption grows by 3 per cent a year then the volume of petroleum imports would have a fivefold increase;

(*c*) If *per capita* consumption of energy grows by 8 per cent a year then the volume of petroleum imports could have a fifteenfold increase, but still leave Papua New Guinea's *per capita* consumption well below the average level for the world.

369. By the early 1980s petroleum imports could require a fifth to a quarter of foreign exchange receipts, quite a substantial burden in a developing country, and the intermediate scenario points to a considerable increase in this burden unless there are vigorous countervailing measures. These measures include the search for those economic alternative sources of energy which have been discussed above.

370. Shorter-term measures require policies for pricing energy, spreading information about resultant price incentives or disincentives and using direct regulation of energy supplies so as to conserve their use. An Energy Planning Unit has been set up in Papua New Guinea's Department of Minerals and Energy to build a data base, to develop a micro-sectoral model for energy and to foster a systematic and integrated approach to energy planning. In October 1980 this planning was further strengthened by a National Energy Planning Council, with an Energy Development Company as its commercial arm. Possibilities of conservation include the following:

(*a*) Industry's main demands for energy relate to direct heating and raising steam so that improvements to insolation, to design of equipment and thermostats and to recovery of heat could effect large savings of energy. Even bigger savings could be gained by the spread of co-generation of electricity and heat from plant which now burns fuel oil to provide heat alone.

(*b*) Large savings of energy could be made in motor transport by converting vehicles, especially trucks, from petrol to diesel fuel, and Papua New Guinea now taxes petrol more severely than diesel fuel. Further savings could be made by using pricing measures and import controls to have more fuel-efficient cars replace less-efficient ones, and to exclude both trucks and cars which have undue "parasitic" fuel loads caused by air conditioners, cooling fans etc. Vehicle occupancy could also be increased by measures to encourage greater use of public transport and to shorten car journeys by control of urban sprawl or better location of shopping centres.

(*c*) Large commercial offices, hotels and shopping complexes all involve high energy costs because they require air conditioning, artificial lighting and lifts to transport people as well as power to operate plant and equipment. Saving could result from changes in the design of such buildings to reduce their height and width; that would lessen the need for lifts and improve ventilation. Better siting, moreover, could reduce exposure to direct heat and improve natural lighting.

(*d*) Home use of energy relates to appliances and to the thermal comfort of dwellings. Import of such appliances could be regulated so as to ensure availability of those which are most efficient in using energy. Thermal comfort, too, could be improved by better design and insulation of dwellings.

371. New Caledonia has also stressed the "promotion of a bioclimatic architecture" for buildings and houses, and envisages differentially low-interest charges for this purpose. In Cook Islands, building codes are to be revised with a similar end in view and tariffs may be lowered on appliances which use local sources of energy; e.g. solar collectors.

372. Samoa is considering higher duties on private imports of buses in order to encourage greater use of public transport. Other conservation measures there include the redesign and upgrading of the distribution system for electricity. An Energy Committee has been set up to find ways of reducing *per capita* consumption of energy generally.

373. Solomon Islands, like a number of other countries, has begun a publicity programme for energy conservation and raised taxes on oil so as to discourage its unnecessary use. Legislation has also been passed to enable the Government to impose fuel restrictions should these seem advisable. Tonga is similarly considering encouragement of solar heaters as substitutes for electric or oil heaters by differential import duties. Tuvalu has emphasized a simpler way of reducing demand for kerosene or other lighting fluids; daylight saving, say of 1.5 hours a day, would reduce the need for lighting.

374. Some discussions have been held about inter-regional co-operation in the South Pacific. The most substantial proposal, perhaps, is that the members of the South Pacific Bureau for Economic Co-operation (SPEC),[65] should try to purchase oil directly from OPEC countries at concessional prices or obtain OPEC support for a subregional programme to reduce petroleum imports. A delegation may be sent in 1981 for this and the associated purpose of requesting development aid. SPEC is also to monitor prices of petroleum supplies to its members, to

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[65] Member countries are Cook Islands, the Federated States of Micronesia (formerly part of the Trust Territory of the Pacific Islands), Fiji, Kiribati, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga and Tuvalu, as well as Australia and New Zealand.

assist with shared information about energy matters or developments and is undertaking an analysis of means to co-ordinate energy activities in the South Pacific. It believes that the search for alternative indigenous sources of energy has become vital to the future economic welfare of island countries and that regional co-operation can assist their discovery and exploitation.

375. An aspect of wider regional co-operation, which is of particular interest to Pacific island countries, is the recent interest expressed by the ESCAP Committee on Shipping, and Transport and Communications in the scope for wind-powered modern vessels in coastal and inter-island trade. The secretariat is undertaking a pilot study of this problem in Indonesia.

VI. REGIONAL, INTERREGIONAL AND INTERNATIONAL CO-OPERATION

376. The problems of energy and of development are of concern to the entire international community of nations. The enormous upsurge in the production of physical outputs that was made possible by accelerated advances in technology during the past three decades was founded on the increasing exploitation of the non-renewable energy sources of this planet. The decade of the 1970s has given clear notice that such a process cannot continue apace and that the world community, as a whole, will need to adjust to a different regime of energy availability, energy use and energy prices.

377. In the developing ESCAP region, too, these same technologies have formed the base of the development strategies already adopted. With the dependence on imported energy sources, the changed international market for energy has had a very significant immediate impact on the developing member countries in this region and poses grave problems for the future.

378. Appropriate action at the national level will be the key to the successful adaptation to the changed energy situation and the acceleration of socio-economic growth in the developing ESCAP countries. Equally well, national policies and practices in the larger energy importers in the international community are of crucial importance since they have a significant impact on a market of which the developing countries are also part.

379. Since the problem of energy has now become of international concern, the potential for collaborative action on a regional, interregional and international basis is considerable.

380. This chapter discusses some of the major possibilities for such co-operation in terms of the major primary energy sources of petroleum, coal, hydroelectricity and new and renewable sources of energy; in maritime transport and in the broader area of external financial resource transfers.

A. PETROLEUM

381. Imported petroleum is the most important source of commercial energy in the developing ESCAP region. In the short term, the likelihood is that this dependence will continue and, even where the proportionate share of petroleum in commercial energy supplies declines, there would be an increase in the absolute quantities required.

382. The availability of adequate and assured supplies of petroleum at reasonable and predictable prices is, thus, of the greatest concern to the oil-importing developing countries of the region.

383. The bulk of the petroleum imported into the region is in the form of crude petroleum for refining in domestic refineries. The trade in refined petroleum products is comparatively small for most developing ESCAP countries except for those developing countries of the region where the absence of domestic refining capacity necessitates the import of refined products only; this being particularly so in the South Pacific.

384. By the very nature of the product, there are significant economies of scale to be realized in the transport and handling of crude petroleum. On the international market, contracts for the supply and transport of very large quantities of crude petroleum are the general rule and such arrangements have been preferred by both buyers and sellers alike. In the developing ESCAP region even the total demand of most individual countries for crude petroleum supplies is comparatively very small by international standards and bulk purchase agreements could assist in lowering purchase prices and assuring supplies. The possibility of regional or subregional arrangements among the developing ESCAP countries for the bulk purchase of crude petroleum is, consequently, worthy of more serious consideration.[66]

385. Furthermore, the transport of crude petroleum by VLCCs[67] or ULCCs[68] could sharply lower transport costs. Member countries of the Organization of Arab Petroleum Exporting Countries (OAPEC) have established a jointly-owned tanker fleet and, since the crude petroleum imports of the developing ESCAP region mainly originate from that region, the possibility of linking regional bulk supply arrangements with the large-scale transport facilities available in the supplying countries could be further explored. Alternatively, developing ESCAP countries could investigate the feasibility of owning and operating their own bulk crude carriers.

386. One of the major problems in such arrangements will be the constraints of currently available

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[66] Appropriate where refineries use the same quality of crude petroleum.

[67] Very Large Crude Carriers of 150,000–250,000 dwt (dead weight tons).

[68] Ultra Large Crude Carriers of over 250,000 dwt.

handling facilities and storage capacities for crude petroleum in individual countries.

387. Where individual developing countries do not already possess the handling and storage facilities for supply from VLCCs or ULCCs, the alternatives could be either (a) to transship from the large bulk carriers onto smaller crude carriers for shipment to shore,[69] or (b) to discharge large bulk crude supplies at central points in the region where handling and storage capacities exist and to transship to consuming points on smaller carriers. In either case, the strategic importance of smaller crude carriers of, possibly, 20,000-30,000 dwt is apparent and developing ESCAP countries could further investigate the feasibility of joint ownership and operation assisted by capital and technical assistance on an international or interregional basis.

388. As noted earlier in this report, changing patterns of national demands for particular refined petroleum products are often leading to unavoidable surpluses and deficits in national refineries consequent on technological rigidities in existing refining facilities. The possibilities for balancing refinery outputs within the region by facilitating the intra-regional trade in refined petroleum products and the possible advantages of jointly-owned petroleum product tankers could also be further investigated.

389. The economies possible through the bulk purchasing of crude petroleum (or of refined products) and in their transportation in bulk are of direct and vital relevance to the member countries of the South Pacific. Given the non-availability of alternate indigenous sources of commercial energy in most of the South Pacific countries, imported petroleum products will continue to play a predominant role in these economies. Every effort should, consequently, be made to reduce the costs of such imports and to assure greater predictability in supply. Among the possibilities worthy of greater consideration are the bulk purchase of crude petroleum by the South Pacific countries for refining (on contract) in refineries in the ESCAP region for supply to the South Pacific in product tankers which could be regionally or subregionally (South Pacific) owned. The possibilities of negotiating preferential prices for both the bulk purchases and for its refining might also be thus enhanced.[70] An incidental benefit might also be the possibility of selling the by-products of refining (e.g. gas, naptha and heavy products) which could be in excess of demands in the South Pacific.

390. In addition to realizing the maximum possible price economies through bulk purchasing and transport, the negotiation of preferential supply and/or price arrangements with oil-exporting countries could also be pursued by groups of countries in the region. Some such arrangements are already effective within the Association of South-East Asian Nations (ASEAN), between the Republic of Korea and some of the oil-exporting countries in the Middle East and in the bilateral supply accords between China and some developing ESCAP countries.

391. In this connexion, it is noted that there already exists a commitment made in 1979 by OPEC to cover all the oil import requirements of developing countries. Further developments of note in other developing regions are (a) the accord reported between Mexico and Venezuela and 14 oil-importing developing countries in the Caribbean and the Central American region whereby 100 per cent of the crude petroleum and refined product needs of the latter group of countries are guaranteed at extremely advantageous financial terms. Payment can be made over a 20-year period at an interest rate of 4 per cent while up to one third of the import cost of petroleum could be used, preferably, for energy-related development projects which could reduce demand for imported energy and be repaid over 20 years at 2 per cent interest. Transportation of supplies will be arranged by the exporters, Mexico and Venezuela; and (b) it is also reported that the African member countries of OPEC (Algeria, Gabon, Libyan Arab Jamahiriya and Nigeria) have decided to guarantee crude and products supplies to all African countries (excluding South Africa): the specific terms are not as yet available.

392. Even prior to these accords, most OPEC and OAPEC members have had special bilateral oil supply arrangements with other developing countries as for example, the bilateral arrangements between Libyan Arab Jamahiriya and other developing African countries and Malta.

393. Statements made by some delegates at the recent 59th OPEC Conference in Indonesia also clearly suggest that there will be, in the future, greater selectivity in the channelling of their oil supplies: the possibility of differential price and supply conditions as between buyers was also specifically mentioned.

394. These trends in the international political and economic fields could benefit the developing countries of this region as well and a concerted effort could be made to explore favourable possibilities with the oil-exporters both within the region and outside the region. Supply and price agreements

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[69] The State Petroleum Corporation of Sri Lanka, which was supplied with crude petroleum every five days by a 30,000 dwt tanker, reports a 30 per cent reduction in handling costs by now shipping suppiles on a 150,000 dwt carrier and transshipping to shore on a 30,000 dwt tanker.

[70] See chapter V.

could open up further possibilities for co-operation in the development of shipping, marketing, storage, refining and terminal facilities, the development of indigenous energy resources and the expansion of trade in general.

395. Most preferential supply and price agreements have specified that there should not be any diversion or on-selling of concessionary supplies and that the consumer in the importing country should benefit from the concessionary prices. In the case of many developing ESCAP countries, the former requirement can be effectively complied with because of the existence of State-ownership of refining and marketing facilities. The latter requirement could enhance social welfare in the importing developing country even though it does go contrary to the dictum espoused by some international agencies regarding the determination of retail consumer prices of energy products.

396. Preliminary investigations suggest that many developing ESCAP countries have promising prospects in oil and natural gas.[71] In most cases, there is a lack of national expertise to evaluate and negotiate agreements with potential partners who offer the capital and expertise. Technical assistance from, and joint exploration ventures with, the oil-exporting countries[72] could provide a countervailing force under such circumstances while the exchange of information among developing countries could greatly increase the bargaining position of developing countries in the process of negotiating oil and gas contracts.

397. At the regional level, the possibilities for co-ordinating regional policies for the negotiation of exploration contracts in oil and gas could be pursued as well as the creation of regional oilfield service companies along the lines of the OAPEC model and the development of joint oil-exploration training facilities in the region.

398. With the declaration of exclusive economic zones (EEZs) there are many tracts of ocean in this region where EEZs overlap and where the territorial limits are yet to be delimited. Such delimitation is often a long drawn-out process because of technical and political considerations. More immediate mutual benefit could, possibly, be sought by investigating possibilities for co-operative ventures in these tracts by the countries concerned[73] and with the assistance of oil-exporting developing countries.

B. COAL

399. In the field of the development of non-oil energy resources, developing ESCAP countries face problems of capital scarcity and lack of technical skills. Coal and hydropower are the two major potential indigenous primary commercial energy sources in the region. At the regional level, expertise in exploring and developing coal deposits is already available. Supplemented by expertise drawn on an international scale the potentials within the region[74] could be better explored provided that more definitive arrangements could be made to elicit the funding required. Initiatives in this field could also be a fruitful avenue for interregional and international co-operation especially if tied into an overall energy development programme at the national level.

400. Even where the prospects for the development of indigenous coal reserves might not be too promising, consideration could be given to the possibilities of replacing the consumption of imported oil by imported coal. This would require a careful examination of relative advantages and, where feasible, would require considerable capital aid and technical assistance to develop the related infrastructural, transport and other capital facilities. Here, too, the role that bilateral or multilateral co-operation could play might be crucial. An overriding consideration in the substitution of imported coal for imported oil would, other factors being favourable, be the availability of supplies on an assured long-term basis at economic prices.

C. ELECTRICITY

401. Electricity, as a form of secondary energy, has been in rapidly growing demand in the developing ESCAP region. Petroleum, coal and hydropower have been the major primary energy sources used for its generation while, in a few developing ESCAP countries, natural gas is increasing in importance as a primary energy source for electricity generation.

402. Petroleum has, by far, been the preferred primary energy source for the generation of electricity in most developing countries in this region because of the relatively shorter time required to bring generating capacities on-stream, because of ease of handling, availability of technical skills and because of the relative cheapness of petroleum over the years.

403. The changed relative price of petroleum has spurred interest in the use of alternate sources of primary energy for electricity generation. While the increased use of indigenous coal and/or the greater

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[71] World Bank, *op. cit.*

[72] The recent agreement between Bangladesh and the United Arab Emirates is indicative of such possibilities. Kuwait has also announced the establishment of a State-owned company to undertake oil exploration abroad (*Bangkok Post*, 30 December 1980).

[73] Preliminary discussions have been reported between Malaysia and Thailand and Indonesia and Papua New Guinea.

[74] World Bank, *op. cit.*

use of imported coal could become increasingly important in some developing ESCAP countries, the potential for the development of hydropower resources is significantly larger.[75] The scope for interregional and international co-operation in the development of hydropower resources in many developing countries of the region is already considerable. Even very much greater is the scope for co-operation if hydroelectricity is to be considered an energy source not purely for consumption within national borders but as an export commodity.

404. Hydropower plants normally have relatively long gestation periods and, at current prices, could be more expensive per installed unit than many alternate means of generation. However, operating costs are significantly lower, imported current input demands are small and cost per generated unit very competitive. The initial capital investment required and the technology of construction are often beyond the capacity of many developing ESCAP countries. Multilateral assistance (mainly through the Asian Development Bank and the World Bank) has played a significant role in hydropower development in the region: the loan projections of such institutions suggest that there could be continuing flows of assistance. However, such assistance has been almost exclusively for national projects to meet national demands.

405. It is in the field of the development of hydropower resources to meet subregional (rather than purely national) demands that the greatest potential for co-operation lies and where least has been done up to now. Where some effort has been made at international co-operation, the results have been gratifying as in the development of the Lower Mekong River Basin where the development of hydro resources at one site (Nam Ngum) has benefited both Lao People's Democratic Republic and Thailand and the potentials for more such projects have been already identified.

406. The potential for the development of very many such projects exists and their development could provide enormous additions to electricity supplies in the region. This is particularly so where the development of the hydro potential of the Himalayan region is concerned. The requirements for capital and technical skills will, no doubt, need concerted international and interregional co-operation. Such co-operation might be more readily forthcoming if the political will could be developed to make the fullest use of the complementarities for trade in electricity. International and interregional interest in the development of such resources might well also assist to reduce the institutional constraints which have hitherto hindered constructive subregional negotiations.

407. These processes might be greatly assisted if the preparatory work already done was to be firmed by a detailed study of electricity supply-demand situations and available potential in subregions of this region with a view to further appraising the technical, economic and financial aspects of electricity generation on a subregional basis.

D. NEW AND RENEWABLE SOURCES

408. Non-commercial energy sources (particularly biomass) are of vital importance in the developing ESCAP region while preliminary estimates suggest that the potential in new and renewable sources of energy could be considerable.

409. Non-commercial energy sources, at present, basically provide energy for cooking purposes and, as discussed earlier, the most promising possibility in the short term is to improve the efficiency in use of such energy sources. In some developing countries of this region considerable progress has already been made in developing fuel-efficient cooking stoves for non-commercial fuels. Much more needs be done in (a) supporting research and development work aimed at developing more fuel-efficient techniques of utilizing non-commercial fuels and which are appropriate to specific conditions in individual countries or even regions within countries; (b) in enabling the establishment of subregional or regional production units for the manufacture of such equipment if economies of scale could be, thereby, realized; and (c) in greater publicity and extension efforts to popularize the acceptance of the newer methods.

410. Regional and international co-operation could have an important role to play both in the research and development effort and in the establishment of subregional or regional production units, where feasible. The elements of the co-operation will, basically, be the provision of capital and technical assistance by donors to enable action at the country, subregional and regional level to realize speedy self-reliance in these fields.

411. An associated field for regional co-operation would be to examine the extent to which technologies in the use of new and renewable resources of direct interest to the region have already been commercialized (protected by patent rights etc.) in order to determine the feasibility of joint purchase and utilization of such technologies.

412. In view of the critical importance of new and renewable resource utilization to the developing

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[75] World Bank, *op. cit.*

ESCAP countries and more particularly to the lower-income and rural population in these countries, the possibility for regional action to narrow the scope of licensing and patent rights on such alternate energy technologies should not be excluded. Cost considerations will weigh very heavily on the adoption of such new technologies and every effort will need to be made to reduce final retail prices to the minimum possible.

413. A comprehensive data bank on new and renewable technologies will play an indispensable role in disseminating information and preventing duplication of research effort. The speedy development of an existing regional institution like the Regional Centre for Technology Transfer could, thus, be another fruitful area for regional and international co-operation.

E. MARITIME TRANSPORT

414. Chapter III drew attention to the definite interest that the developing ESCAP countries have in the adoption of more fuel-efficient practices in maritime transport. The structure of the international maritime transport industry makes it imperative that international action in this field should form an important and integral part of global action in the field of energy.

415. At the regional level, immediate action in energy conservation in maritime transport could be initiated through the co-operation of shippers, shipowners and Governments to rationalize existing shipping services. Such joint regional planning for shipping services within the region could include, *inter alia,* the reduction in existing overtonnages on certain routes as a means of fuel conservation, securing greater fuel efficiency by reducing or replacing overaged ships, reducing the operating speeds of some liners and a reduction in the turnaround times at ports.[76] The detailed analysis that would be required for the implementation of such measures will need to be speedily initiated with the co-operation of the parties concerned with strong co-operative initiatives from the Governments of developing ESCAP countries.

416. As earlier discussed in this chapter, the potential for the joint ownership of crude and petroleum product carriers is worthy of detailed study by the developing countries of this region. Such detailed studies could also be made of the potential for joint ownership of general freight carriers.

F. OTHER MAJOR ISSUES

417. The foregoing sections have briefly outlined the main areas in which regional, interregional and international co-operation could be most effective in tackling the problem of energy in the developing ESCAP countries. Many of these possibilities are capable of realization in the short term while, in all cases, action will need to be initiated in the short term.

418. The longer-term perspective of accelerating socio-economic development needs to provide the framework within which such short-term initiatives and policies are determined and this is nowhere, possibly, as of importance as in the interrelationships between energy and development. With energy pervading all sectors of economic activity, the adjustment to the changed energy situation would require a restructuring of the economy which makes it all the more imperative to ensure that the development process is not hindered by continuing problems in the availability of capital and foreign exchange.

419. The abrupt strain on the foreign exchanges consequent on the oil price increases of 1973-1974 was adjusted to without grave economic dislocation or setback because of fortuitous events which boosted export receipts and made commercial credits more freely available. These circumstances are most unlikely to continue to exist and preliminary indications are that the adjustment to the oil price increases of 1979-1980 have been much more difficult for most developing ESCAP countries.

420. Given the very real possibility that energy prices will continue to increase in both nominal and real terms, developing ESCAP countries will need larger access on a more predictable (and less conditional) basis to foreign exchange sources to cope with short-term disturbances and to sustain the tempo of longer-term development.

421. The development of indigenous energy sources, the restructuring of the economy and the acceleration of socio-economic development in the developing ESCAP countries will be determined, to an important extent, by the availability of adequate concessional foreign resources flows. The imperative for the more developed members of the international community of nations to respond to these needs as an integral and important component of the objective of achieving equitable and stable growth in the world economy can hardly be overstressed: commercial bank borrowings are not a substitute for such concessional flows nor even are the conditional resources provided by multilateral agencies.

422. Resource flows from the oil-exporting countries have continued to increase and have supple

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[76] Report of Committee on Shipping, Transport and Communications on its fourth session (E/ESCAP/215).

mented assistance from the developed countries. A concerted regional effort should be made to increase such flows along with the development of mutually beneficial forms of financial and economic co-operation. Since the twin concerns of energy and development are being addressed on an international basis, the feasibility of augmenting the flow of capital resources to the developing countries from the proceeds of surcharges levied on the imports of non-renewable energy resources by the developed countries could also be considered.

423. Finally, it might be stressed again that political parameters of international relationships have steadily grown in importance. The increased political co-operation among the developing countries which has been evident in international forums provides a sound base for the development of closer economic ties and the wide-ranging possibilities in this field (some of which have been discussed earlier) should be more intensively pursued as an integral part of the continuing process to bring about a new international economic order.

TECHNICAL APPENDIX I

1. Reliable estimates of the income and the price-elasticity of demand for energy would greatly assist policy formulation, particularly if such estimates could be obtained by economic sector and by type of energy. While adequate data are not available for detailed sectoral estimates, the limited scope for interfuel substitution in the short term enables energy to be treated as a single factor.

2. Individual country-wise time-series analysis of energy consumption was also precluded because of data limitations and this model follows the procedure of estimating energy-demand elasticities from cross-section and, then, indirectly estimating country-wise price-elasticities. Such a procedure also eliminates the problems of handling serial correlation of errors and a changing environment which are associated with time-series analysis.

3. The model seeks to obtain tentative estimates of the trend in the response of energy consumption in individual developing ESCAP countries to changes in incomes and prices by (a) estimating income-elasticities from cross-section data, (b) obtaining a residual between the actual change in energy consumption in individual countries (from time series data) and the income-elasticity derived under (a); this residual is taken as explained by price changes, and (c) is used along with information on price changes to obtain tentative estimates of price-elasticities.

4. The model seeks to explain the *per capita* consumption of commercial energy ("y") in developing ESCAP countries with the following explanatory variables:

Per capita GNP	(x_1)
Percentage of population in urban areas	(x_2)
Percentage of industrial output in GDP	(x_3)
Indirect taxes per unit of consumption expenditure	(x_4)

5. Two significant shortcomings in the choice of explanatory variables are: (a) the lack of adequate data on income distribution, and (b) the lack of adequate and comparable data on the transport sector.

6. An index of indirect taxes was used as one of the explanatory variables in the model both because of their importance in individual economies and because indirect taxes capture more comprehensively the diverse rates of taxes and duties on energy sources and the multiplicity of taxation that impinges on the energy input through the production process to the final retail price of the commodity. It was, in any case, not feasible to separate out only the tax component from the price of energy products.

7. A multi-collinearity problem arose in the model due to the close correlation between investment-income ratios and industry-GDP ratios and, consequently, only the latter variable was included.

8. The wide range in *per capita* incomes in the countries included in the model raised the possibility of heteroskedasticity. Elasticities were computed both from the original data and by normalizing all variables with respect to *per capita* income: the results were almost identical.

9. The regression equations for the years 1972, 1977 and 1978 are given below:

A. Uncorrected for heteroskedasticity:

$$1972:\quad \log y = \underset{(0.7)}{-0.78} + \underset{(3.5)}{0.70 \log x_1} + \underset{(1.6)}{0.28 \log x_2} + \underset{(2.5)}{1.03 \log x_3} - \underset{(-1.5)}{0.34 \log x_4}$$

$$R^2 = 0.94, \qquad F = 39.21$$

$$1977:\quad \log y = -0.86 + \underset{(3.15)}{0.68 \log x_1} + \underset{(1.68)}{0.44 \log x_2} + \underset{(1.62)}{0.87 \log x_3} - \underset{(-1.70)}{0.30 \log x_4}$$

$$R^2 = 0.94, \qquad F = 41.78$$

$$1978:\quad \log y = -0.70 + \underset{(3.5)}{0.70 \log x_1} + \underset{(1.8)}{0.48 \log x_2} + \underset{(1.55)}{0.64 \log x_3} - \underset{(-1.3)}{0.31 \log x_4}$$

$$R^2 = 0.93, \qquad F = 35.80$$

The constant terms were nowhere significant but all other variables were everywhere significant at the 5 per cent level and income at the 1 per cent level. The Durbin-Watson statistic was invariably near about 2, as is to be expected in a cross-section model. The income-elasticity is stable around 70 per cent and tax-elasticity at about −30 per cent. Elasticities steadily increase with respect to urbanization and steadily fall with respect to industrial output.

B. Corrected for heteroskedasticity:

$$1972: \quad \log y = 0.65 + 0.71 \log x_1 + 0.28 \log x_2 + 1.00 \log x_3 - 0.34 \log x_4$$

$$1977: \quad \log y = 1.09 + 0.66 \log x_1 + 0.43 \log x_2 + 0.83 \log x_3 - 0.30 \log x_4$$

$$1978: \quad \log y = 0.89 + 0.71 \log x_1 + 0.46 \log x_2 + 0.56 \log x_3 - 0.37 \log x_4$$

10. An income elasticity of about 0.7 is clearly suggested by the model. As this estimate was considerably smaller than that suggested by other models,[a] the equations of this model were re-estimated for 1977 and 1978 by successively dropping x_4, x_4 and x_3, and x_4, x_3 and x_2. These results suggest that the differences in the estimate of income elasticity have been due to the differences in the specification of explanatory variables. In this model, too, if *per capita* GNP were retained as the only explanatory variable, income elasticities of 1.27 for 1977 and 1.24 for 1978 are obtained.

11. The coefficients suggest an income-elasticity of less than unity. However, energy consumption could increase even with a constant income if, for example, urbanization increases. However, energy consumption due to industrial output expansion is falling at the margin, perhaps due to a combination of increased productivity of energy and conscious energy-saving measures. The depressing, and gently rising, impact of indirect taxes is also noted: the role of income-distribution needs be investigated further as energy-intensive products are largely consumed by the upper-income classes. Also, the sum of the exponents in each equation is significantly greater than unity, implying that if all the variables increased, for example, by 1 per cent then energy consumption would increase by much more than 1 per cent.

12. The computed income-elasticity of 0.7 was, then, used in individual country time-series data to obtain an estimate of the change in energy consumption assignable to energy-price change alone. Short-run (annual) partial price-elasticities were computed from 1972/73 to 1977/78 (six observations) for 13 economies because neither x_2, x_3 nor x_4 changed by more than a few percentage points between adjacent time periods except in Indonesia (1977) and Singapore (1975-1977). Probably due to exceptional factors, seven out of the 80 observations in table I-1 turned negative: major changes are identifiable in all such exceptional cases.

13. The over-all patterns in table I-1 are:

(a) Very low price-elasticities generally well below unity.

(b) Over the period, price-elasticities have gently fallen and then increased equally slowly towards the end of the period;

(c) Price-elasticities of above unity are largely in the oil-exporting countries.

Table I-1. Computed annual price-elasticity estimates for energy consumption *per capita*

	1972/73	*1973/74*	*1974/75*	*1975/76*	*1976/77*	*1977/78*
Bangladesh	1.0	1.7	1.05	—[a]	—[a]	0.002
Burma[b]	0.41	0.2	1.78	0.31	—	0.53
Hong Kong	2.41	0.44	0.59	1.0	—[a]	0.57
India	0.48	0.19	0.2	0.3	0.38	1.01
Indonesia	0.42	0.10	1.0	1.92	—[a]	1.22
Malaysia	11.4	0.97	0.36	0.45	1.54	1.73
Pakistan	0.35	0.28	0.49	0.33	0.43	0.27
Papua New Guinea	0.8	0.29	0.30	—	0.53	0.2
Philippines	0.7	0.9	0.10	0.21	0.14	0.29
Republic of Korea	0.19	0.49	0.45	0.85	0.30	0.5
Singapore	4.5	0.48	—[a]	—[a]	1.08	...
Sri Lanka	0.4	0.8	0.4	0.36	0.24	0.56
Thailand	...	0.89	0.06	—	0.03	0.38

Sources: Asian Development Bank, *Key Indicators of Developing Member Countries*; United Nations, *World Energy Supplies;* United Nations, *Statistical Yearbook;* United Nations, *Monthly Bulletin of Statistics*; ESCAP, *Statistical Yearbook for Asia and the Pacific;* World Bank, *World Tables*; World Bank, *World Development Report*; International Monetary Fund, *Government Finance Statistics*; and various national sources.

Notes: [a] Sudden increases in investment.

[b] There were sharp changes in the prices of fuel and power in Burma.

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[a] Government of India, *Working Group on Energy Policy*, 1979, used only *per capita* as an explanatory variable and suggests income-elasticities of 1.95 (1953/54 to 1960/61) declining to 1.79 (1960/61 to 1975/76). Maddala, Chern and Gill, *Econometric Studies in Energy Demand and Supply* (New York, Praeger, 1978), derive a price-elasticity of –0.70 and an income-elasticity of 0.41 for the United States and also report similar estimates of –0.53 and 0.48 respectively by Nisseu and Knapp and –0.80 and 0.62 respectively by Baughman and Joskow.

TECHNICAL APPENDIX II

1. Energy inputs work in conjunction with raw materials, capital goods, labour and such other productive factors in producing output. A rise in the price of any input is conventionally expected to cause a shift to a more intensive use of the other inputs, where technically possible. When the prices of energy increase and it is impossible to so substitute, then, the entire cost increase of energy will be absorbed into commodity prices. Otherwise, a reduction in energy inputs will be fully translated into a proportionate reduction in output. However, where the substitution of energy inputs by other inputs is feasible, then a rise in energy prices could encourage an increase in the use of other inputs and a fall in energy use.

2. The substitution of energy by capital or labour inputs is a complicated phenomenon because this could entail a change in the *composition* of capital stock in favour of less energy-intensive stock. So, too, in the case of labour, where beyond a certain point, newer skills will be required.

3. This problem was analyzed by Hogan and Manne[a] with the use of an economy-wide production relation of the following type:

$$Y = F(E,K,L) =$$

$$\gamma\left(aE^{\frac{\sigma-1}{\sigma}} + b\,(cK^{\propto}L^{1-\propto})^{\frac{\sigma-1}{\sigma}}\right]^{\left(\frac{\sigma}{\sigma-1}\right)\mu} \quad \ldots\ldots\ldots\ (1)$$

where Y is an index of aggregate output, E of energy, K of capital used and L of employment. This is the standard CES production relation where σ measures the elasticity of substitution between E and the combined index of K and L written as $cK^{\propto}L^{1-\propto}$. Hogan and Manne assume $\propto = 0.35$ and given initial values (e.g., initial capital output ratio = 2.5) show that the reduction in Y consequent upon a given cut in E rises sharply as σ falls. For $\sigma = 0.10$, for example, a fall of E from 220 to 70 reduces GNP by 2,447; but if $\sigma = 0.7$, then the latter reduction is only 316.

4. A similar model was used in this exercise for manufacturing industry in three ESCAP countries but parameter σ was estimated directly (rather than assumed as in the original model) by pooling the cross-section data for India, Republic of Korea and Thailand over the years 1970-1976. Since capital stock data were scanty, an initial capital-output ratio of "b" was assumed for 1970-1971 and subsequently "b" was varied from 2.0 to 4.0 for sensitivity analysis. The data on gross fixed capital formation by country was then used to build up a stock series. Inventories were neglected as being unnecessary in a production model but no account of capital mortality could be taken although it could be assumed that within a five-year span, the effect of this factor on the stock series could be minimal in developing countries which typically show a much slower rate of capital mortality.

5. Parameter $\propto$ was also ranged between 0.3 to 0.5 in building up the joint index of capital and labour ($cK^{\propto}L^{1-\propto} = V$).

6. Econometrically the problem was posed as an unrestricted linearized approximation to equation (1) above, i.e.,

$$\log Y = \log\gamma + \mu\delta\log E + \mu(1-\delta)\log V - \tfrac{1}{2}\rho\mu\delta(1-\delta)\,[\log E - \log V]^2 + \varepsilon \quad \ldots\ldots\ (2')$$

$$\text{or, } \log Y = \beta_1 + \beta_2\log E + \beta_3\log V + \beta_4\,[\log E - \log V]^2 + \varepsilon \quad \ldots\ldots\ (2)$$

where ε is a random term

$$\left.\begin{aligned} \gamma &= \text{antilog } \beta_1 \\ \delta &= \frac{\beta_2}{\beta_2+\beta_3}, \quad 0<\delta<1 \\ \mu &= \beta_2+\beta_3 > 0 \\ \rho &= \frac{-2\beta_4(\beta_2+\beta_3)}{\beta_2\beta_3} \geq -1,\ \sigma = \frac{1}{1+\rho} \end{aligned}\right\} \ldots\ldots\ (3)$$

This formulation is derived by linearization around $\rho = 0$ so that the maintained hypothesis is that the elasticity of substitution is unity (Cobb-Douglas). Thus the test is biased against a CES. but if β_4 is significantly different from zero, the equation could approximate a CES and not a Cobb-Douglas.

7. Cross-section and time-series data was pooled while successively filtering the model of autocorrelation (due to time-series) and heteroskedasticity (due to cross-section).[b] The Durbin-Watson in the uncorrected first regression was high at 1.8 or above suggesting no autocorrelation; also, the estimated autocorrelation coefficient γ for the Republic of Korea subsample was greater than unity so that the parameter was unstable. A full-sample estimate of γ was less than unity, however, so that it could be

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[a] "Energy-economy interactions: The fable of the elephant and the rabbit", in C. J. Hitch (ed.). *Energy Conservation and Economic Growth* (Colorado, Weshrew Press Inc., 1978).

[b] See J. Kmenta, *Elements of Econometrics* (New York, MacMillan, 1971), chapter 12, section 2 for details.

used, alongside of an alternate estimate where, in view of the high Durbin-Watson, the model was asked to proceed directly to correcting for heteroskedasticity. This latter exercise gave better results and is reported below.

8. Given the shaky basis of the capital-stock data, the results of this model should be treated as very preliminary. The growing importance of the manufacturing sector and the declining elasticity of energy consumption with respect to industrial output (see technical appendix I) suggest the importance of more detailed analysis at the individual country level to investigate the substitution of energy by other inputs.

9. In proceeding from the unrestricted estimation equation (2) to the parent model (2′), via by (3)— due to exact identification—the four parameters γ, δ, μ, and ρ can always be found but *a priori* there is nothing to ensure that the inequality restrictions on them (as in (3)) will be obeyed. The problem surfaced in Kmenta's original paper too[c] where δ was estimated outside the model. Manne[d] adopted the procedure of equating marginal value products to prices, getting two equations to fix δ and $1-\delta$. This last procedure is standard, when prices are available, in CES function estimation. In the absence of adequate price data, the direct form equation (2) was used in the present exercise and it was found, in a few of the numerous sensitivity tests, that the boundary condition on δ was being violated. Since δ is proportional to the share of E in this model where capital and labour combined get a share proportional to $1-\delta$, a restriction was imposed on β_2 and β_3 in the form of

$$\frac{1}{16} \leq \frac{\beta_2}{\beta_2 + \beta_3} \leq \frac{1}{8} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

implying the prior restriction that, *ceteris paribus*, the share of energy inputs alone do not exceed about 14 per cent of output. Equation (2) was re-estimated under the restriction (4) and it was observed that the estimates (of ρ) varied by hardly 10 per cent for the entire interval. Reported below are two sets of results for $\beta_2/\beta_3 = 1/15$ and $1/7$ standing for $\delta = 1/16$ and $1/8$ respectively.

10. Table II-1 ($\beta_2/\beta_3 = 1/15$) and table II-2 ($\beta_2/\beta_3 = 1/7$) list the values of the elasticity of substitution σ for different combinations of initial capital/output ratio (b) and the exponent of capital ($\propto$). The estimated equations are presented in tables II-3 and II-4. The interesting features are: (a) β_4 being insignificant for $\propto = 0.3$, (b) β_4 being significant at all higher values of $\propto$ and (c) the surprisingly powerful over-all goodness of fit as seen by the R^2-index, the t-values, the F-value and the D-W statistic.

Table II-1. Values of σ ($\beta_2/\beta_3 = 1/15$)

b $\propto$	2.0	2.5	2.75	3.0	3.25	4.0
0.3 . .	1.0	1.0	1.0	1.0	1.0	1.0
0.4 . .	1.0	0.43	0.40	0.38	0.37	0.25
0.5 . .	0.33	0.29	0.25	0.24	0.22	0.18

The estimates 1.0 corresponds to equations in which β_4 was not found to be significant so that the hypothesis of $\rho = 0$ ($\sigma = 1$) could not be rejected.

11. These results need to be carefully interpreted. Parameter $\propto$ is the exponent of capital in capital-labour index; capital's value share (*à la* Manne). Parameter b captures the average physical productivity of capital stock at the starting date. If, subsequently, capital and output grow at the same rate, then b will gently fall. The value of $\propto$ in economy-wide models is often taken around 0.3. For the manufacturing sector alone, it is more likely to be in the 0.4 to 0.5 range. At $\propto = 0.3$, σ stays put at unity for all b. In the intermediate regime, σ falls as b rises (see annexed diagrams).

12. A separate diagram has been drawn for each of the initial capital/output ratios which have been varied from 2 to 4 and with two curves drawn for $\lambda = 1/8$ and $\lambda = 1/16$ respectively. The vertical axis measures σ and the horizontal axis measures $\propto$.

Table II-2. Values of σ ($\beta_2/\beta_3 = 1/7$)

b $\propto$	2.00	2.5	2.75	3.00	3.25	4.00
0.3 . .	1.00	1.00	1.00	1.00	1.00	1.00
0.35 . .	1.00	1.00	1.00	1.00	1.00	1.00
0.40 . .	1.00	1.00	0.41	0.38	0.35	0.29
0.45 . .	0.40	0.34	0.31	0.29	0.27	0.23
0.50 . .	0.33	0.27	0.25	0.23	0.22	0.21

13. The diagrams demonstrate a strikingly consistent pattern. For low values of $\propto$, σ is high and near unity. For $\propto$ going from 0.3 or 0.35 to about 0.5, the two curves are very close together and σ drops to about 0.325 (for b = 2) or 0.18 (for b = 4). Over the relevant range of $\propto$ (0.3 to 0.45) the pattern is remarkably insensitive to λ (which has been varied by 100 per cent).

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[c] J. Kmenta, *International Economic Review* (Philadelphia and Osaka), 1967.

[d] A. Manne, "ETA-MACRO: a model of energy-economy interaction", in R. S. Pindyck (ed.), *Advances in the Economics of Energy and Resources* (Greenwich, Conn., JAI Press, Inc., 1979), vol. 2.

Table II-3. Selected equations
($\lambda = 1/16$)

α^a	β_1	β_2	β_3	β_4	R^2	DW	F
			b = 2.0				
0.35	...	...	...	...	...	...	...
0.40	0.18 (0.57)	0.23 (4.01)	0.76 (9.24)	−0.09 (−1.02)	0.99	1.26	3145.01
0.45	...	...	...	...	...	...	...
0.50	0.38 (1.41)	0.22 (5.69)	0.73 (12.37)	−0.17 (−2.00)	0.99	1.37	4378.69
			b = 3.0				
0.35	...	...	...	...	...	...	...
0.40	0.15 (0.49)	0.21 (4.75)	0.77 (11.42)	−0.13 (−1.29)	0.99	1.39	6943.84
0.45	...	...	...	...	...	...	...
0.50	0.28 (1.17)	0.15 (4.42)	0.80 (16.58)	−0.21 (−2.54)	0.99	1.47	13335.93
			b = 4.0				
0.35	...	...	...	...	...	...	...
0.40	0.14 (0.49)	0.18 (4.75)	0.79 (13.39)	−0.17 (−1.73)	0.99	1.47	11270.51
0.45	...	...	...	...	...	...	...
0.50	0.20 (0.86)	0.11 (3.14)	0.84 (19.13)	−0.21 (−2.90)	0.99	1.48	22656.11

Note: Figures in parentheses are t-value.

[a] β_4 not significant if α is 0.3 or less.

Table II-4. Selected equations
($\lambda = 1/8$)

α^a	β_1	β_2	β_3	β_4	R^2	DW	F
			b = 2.0				
0.35	0.09 (0.29)	0.23 (4.06)	0.78 (9.92)	−0.06 (−0.80)	0.99	1.22	3257.78
0.40	0.18 (0.62)	0.23 (4.69)	0.76 (10.70)	−0.10 (−1.15)	0.99	1.26	3204.76
0.45	0.28 (1.02)	0.23 (5.52)	0.74 (12.03)	−0.13 (−1.61)	0.99	1.31	3644.62
0.50	0.36 (1.47)	0.22 (6.39)	0.74 (14.18)	−0.17 (−2.17)	0.99	1.38	5317.00
			b = 3.0				
0.35	0.05 (0.16)	0.22 (4.80)	0.78 (11.69)	−0.08 (−0.93)	0.99	1.32	6066.71
0.40	0.13 (0.48)	0.20 (5.52)	0.78 (13.55)	−0.13 (−1.43)	0.99	1.39	7430.93
0.45	0.21 (0.86)	0.18 (5.82)	0.78 (16.50)	−0.18 (−2.07)	0.99	1.43	10214.69
0.50	0.26 (1.22)	0.15 (5.54)	0.80 (20.71)	−0.21 (−2.77)	0.99	1.42	15379.23
			b = 4.0				
0.35	0.03 (0.12)	0.20 (5.33)	0.79 (13.24)	−0.12 (−1.23)	0.99	1.41	8989.19
0.40	0.12 (0.46)	0.18 (5.57)	0.80 (16.25)	−0.18 (−1.90)	0.99	1.45	12227.73
0.45	0.19 (0.78)	0.14 (5.27)	0.82 (20.54)	−0.21 (−2.57)	0.99	1.43	17642.32
0.50	0.20 (0.91)	0.12 (5.18)	0.83 (25.19)	−0.20 (−2.91)	0.99	1.40	24346.78

Note: Figures in parentheses are t-value.

[a] β_4 not significant if α is 0.3 or less.

14. In this model, the average "b" coefficients change very slowly, if at all. But variation in $\propto$ can be correlated with market forces causing changes in input prices, thus changing the optimum input coefficients. A higher $\propto$, as between two situations would have to correspond to a combination of (a) a higher price of capital goods relative to wages and (b) a higher capital-labour ratio, so that capital's share (price times capital use) rises.

15. Thus, for all values of b upto 4, σ continuously falls as $\propto$ rises, but it falls faster and deeper when "b" is high and slower and less when "b" is low. A high capital investment per unit of output implies, generally, a lower substitution elasticity of energy by non-energy inputs since there is already a surfeit of capital in the system and, at high capital output ratios, the quality of capital goods itself changes; more mechanization almost always goes hand in hand with higher complementary use of energy. Energy price increases, consequently, tend to be absorbed into product price increases.

16. The impact of given policy changes and changes in exogenous variables in terms of their impact on the scenario could be tentatively identified. With parameter specifications of a b-value of 3.0 and $\propto$ equal to 0.4, σ will be equal to 0.38 which would correspond to Manne's middle range rather than low range for σ. The estimated output loss for an energy tax that raises price by 600 per cent (and reduces energy consumption by 100 per cent) is 500 per cent at the margin.

17. Energy use could, thus, be regulated by a policy package of taxes on both capital and energy prices. For example, a tax on profit income or a change in e rate of return to capital through an adjustment he interest rate or other fiscal policies that encourage processes with lower capital share would lead to the adoption of a lower $\propto$, higher σ technique. If thereafter energy price is raised, then there will be substitution away towards non-energy inputs. This general possibility that energy use can be regulated by controlling prices of non-energy inputs could be important in energy management.

18. The sensitivity analysis around energy share necessitated by the parameter restriction imposed in the model (paragraph 9) is given below. The theoretical structure of the CES model underlying the present exercise is:

$$Y = \gamma [\delta E^{-\rho} + (1 - \delta)(K^{\propto} L^{1-\propto})^{-\rho}]^{-\mu/\rho}$$

estimated in the linearized form as

$$Y = \beta_1 + \beta_2 \log E + \beta_3 \log V + \beta_4 (\log E - \log V)^2 + \varepsilon$$

where $V = K^{\propto} L^{1-\propto}$

In order to get meaningful results, $0 \leq$ and ≤ 1 must be obeyed, for which it was necessary that

$$0 < \delta = \frac{\beta_2}{\beta_2 + \beta_3} < 1$$

The last inequality could be guaranteed by imposing two parameter restrictions

$$\beta_1 \geqq 0 \quad \text{and} \quad \beta_2 \geqq 0$$

Instead, the combined weaker restriction was imposed

$$\frac{\beta_2}{\beta_2 + \beta_3} < 1$$

which leaves open the possibility of the ratio being negative. In the actual estimates, this did not happen which increases their reliability.

19. In economic terms, δ is proportional to the value share of E. Since all other inputs have been covered, it seemed to be quite sufficient to let δ vary between 7.5 to 14 per cent. This involved varying $\beta_2/\beta_3 = \lambda$ from 1/8 to 1/16.

20. The observed evidence suggests a reasonably high (but less than 100 per cent) degree of substitutability of energy by other inputs. Since the model included a reasonably wide band of the manufacturing sector in the ESCAP region which has had a declining elasticity of *per capita* energy consumption with respect to industrial output over the years 1972-1978 (see technical appendix I), the hypothesis that with rising energy prices capital and labour inputs have been substituted for energy inputs should be more closely investigated at the national level.

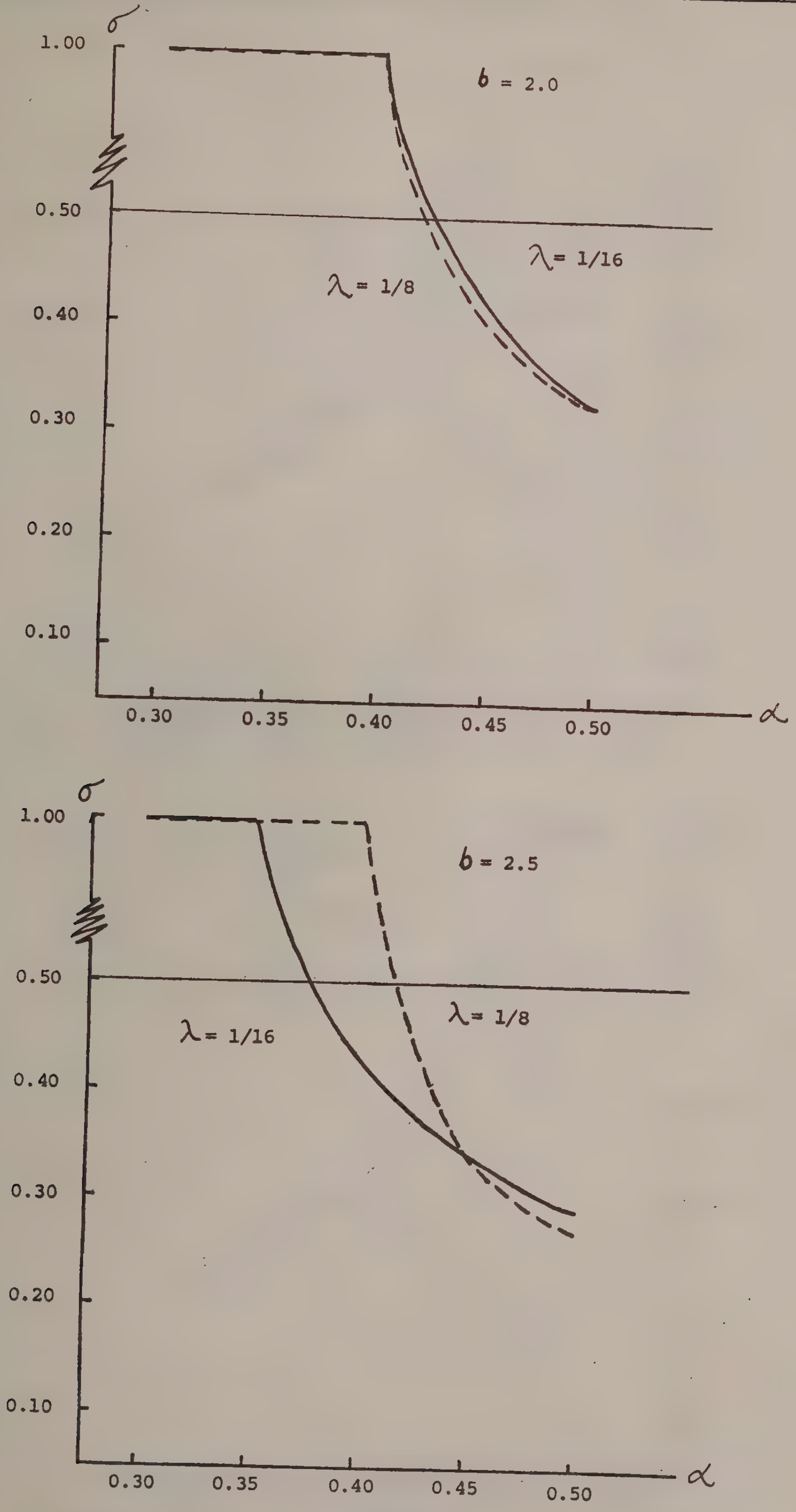
σ
1.00
0.50
0.40
0.30
0.20
0.10
b = 2.0
λ = 1/16
λ = 1/8
0.30
0.35
0.40
0.45
0.50
α
σ
1.00
0.50
0.40
0.30
0.20
0.10
b = 2.5
λ = 1/16
λ = 1/8
0.30
0.35
0.40
0.45
0.50
α

Diagram 1

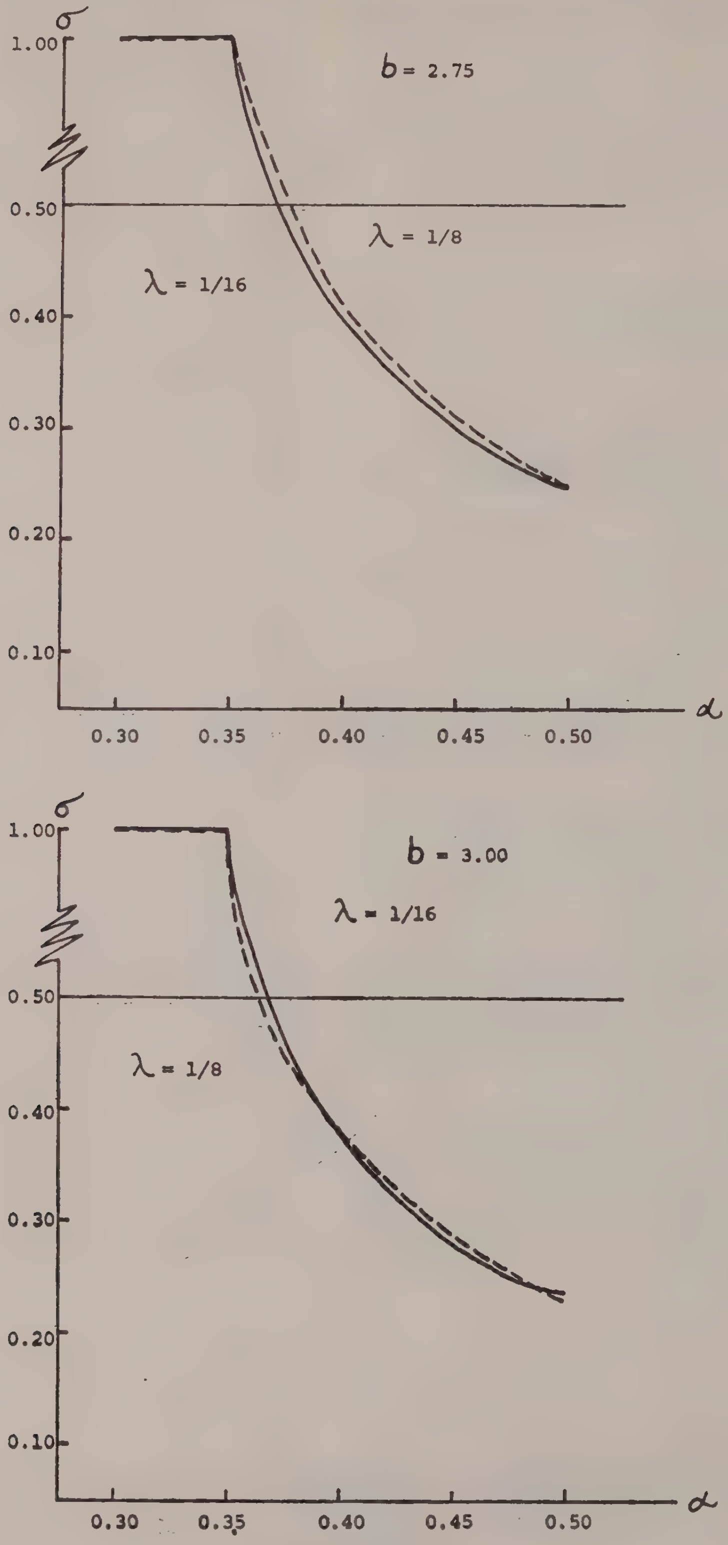
σ
1.00
0.50
0.40
0.30
0.20
0.10
b = 2.75
λ = 1/8
λ = 1/16
0.30
0.35
0.40
0.45
0.50
α
σ
1.00
0.50
0.40
0.30
0.20
0.10
b = 3.00
λ = 1/16
λ = 1/8
0.30
0.35
0.40
0.45
0.50
α

Diagram 2

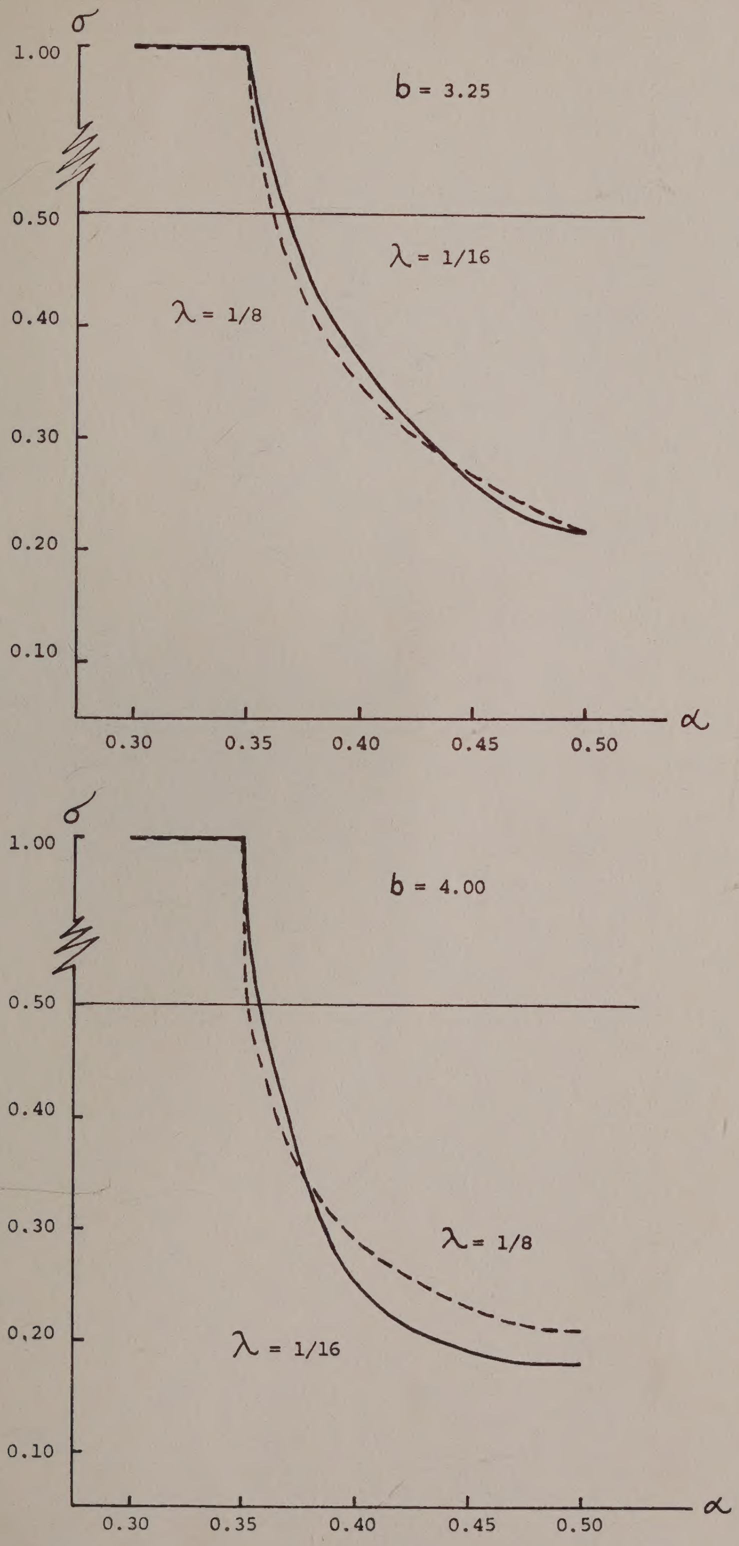
σ
1.00
0.50
0.40
0.30
0.20
0.10
b = 3.25
λ = 1/16
λ = 1/8
0.30
0.35
0.40
0.45
0.50
α
σ
1.00
0.50
0.40
0.30
0.20
0.10
b = 4.00
λ = 1/8
λ = 1/16
0.30
0.35
0.40
0.45
0.50
α

Diagram 3

كيفية الحصول على منشورات الامم المتحدة

يمكن الحصول على منشورات الامم المتحدة من المكتبات ودور التوزيع في جميع انحاء العالم . استعلم عنها من المكتبة التي تتعامل معها أو اكتب الى : الامم المتحدة ،قسم البيع في نيويورك او في جنيف .

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